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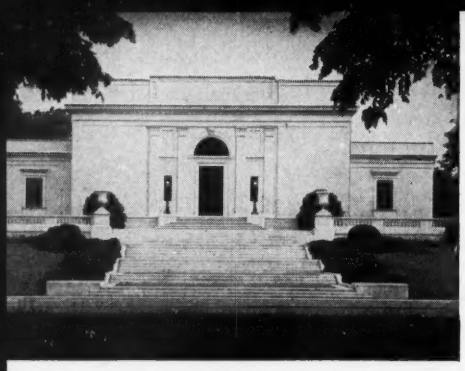

STRAIGHT FROM HEADQUARTERS

by ***ROBERT P. FISCHELIS,*** Secretary
AMERICAN PHARMACEUTICAL ASSOCIATION

Publicity and Public Acceptance

FROM the "Crossroads of the West" there comes each Sunday morning "The Spoken Word" by Richard L. Evans over the Columbia Broadcasting System. It is a part of the program from the Tabernacle on Temple Square in Salt Lake City. Not long ago Mr. Evans commented on publicity and public acceptance in these words:*

> It is quite common, of course, for people to be employed to paint word pictures of other people to suit every passing purpose. Many titles, earned and unearned, have been created for publicity purposes for people who were bidding for public approval. Indeed an able campaign of publicity can put out impressions for public consumption that can create almost any effect in the minds of people who are not otherwise informed. But there are some things publicity can't do, as well as some things, it can do
>
> Publicity may promote public acceptance, but it can't change qualities of character. Publicity may paint a glowing picture, but it can't create talent where it doesn't exist, nor wisdom where it isn't to be found. Publicity may magnify the stature of a man in the public eye, but it cannot magnify the man in his essential attributes. Publicity may smooth over the surface, but it doesn't change the substance of things not seen. And regardless of what things are made to seem to be, "seeming" and "being" aren't the same thing. Merely saying something is so doesn't make it so. And this is true whether we are trying to tear a man down or build him up.
>
> And so whenever we attempt to appraise publicity and public pronouncement, we should consider the source and the purpose, and not be too quick in judgment in either direction, for things aren't always what they seem. When we buy goods and commodities, we legally demand that they be what the label says they are. Should we ask less of people? Or should we not say to everyone who chooses to become part of the public parade: Be what the publicity you present, or permit says you are. Should we not say to everyone, publicly and privately, ourselves included: Be what you seem to be. Be what you would have others think you are, and don't depend upon publicity to make the surface cover the substance.

This brief sermon needs to be impressed upon the unthinking members of our profession who believe that all of pharmacy's ills can be cured by a "publicity campaign" that will magnify a few virtues to cover all our faults. It has been shown conclusively that when American pharmacy accomplishes something worth while it does not require any manufactured ballyhoo to make the facts known to the public.

Recent announcements of various campaigns of publicity to correct alleged false impressions or to win public acceptance for products for self-medication lead us to express the hope that those sponsoring such campaigns will take to heart the "spoken word" from Salt Lake City.

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Fred C. Felter

THE death of Fred C. Felter, publisher of the *Pacific Drug Review*, removes from pharmaceutical journalism one of the few men in this field who, while serving a particular section of the United States, kept a close watch on national affairs and interpreted them to readers with rare accuracy and fairness. In his editorial columns Fred Felter fought fairly and openly for what he considered the best interests of pharmacy.

While at times he expressed points of view that revealed lack of adequate background information, the conclusions he drew from the information available to him were always fair and constituted sound thinking.

He sought diligently to present all sides of

important issues. The questions he directed to national associations and to their officers and other individuals competent to discuss problems confronting pharmacy demanded straightforward replies. And if such replies were not forthcoming, Mr. Felter did not hesitate to comment accordingly. It was apparent that he liked men who face issues squarely.

All of this made the *Pacific Drug Review* the most effective privately conducted pharmaceutical publication in the geographic area covered and one of the best sectional pharmaceutical journals in the United States. Its editorials and contributed articles have been particularly noteworthy and it is reassuring that active management now passes to Fred Felter's sons who received training under him and whose tribute to their late father in their April issue is a measure of their loyalty to the ideals which have made the *Pacific Drug Review* a great journal in our field.

Student Organizations

THE rapid growth of the student branches of the AMERICAN PHARMACEUTICAL ASSOCIATION is one of the developments that augurs well for the future of the A. PH. A. The early suggestions and recommendations of Past President Serles and the arduous labors of President-Elect Little, as chairman of the Committee on Local and Student Branches for many years, have borne fruit. Today the ASSOCIATION has actively functioning student branches in 58 schools and colleges of pharmacy, with a total membership of more than 8000.

These branches are serving as centers for concentration of interest in professional practice. It is well for these organizations to listen to speakers representing various phases of pharmaceutical practice. College professors and administrators, board of pharmacy members and other law-enforcement officials have worth-while messages to bring to these young men and women about to enter the profession; so have pharmacists, pharmaceutical chemists, research workers and administrators in the drug industry. The more these future pharmacists learn at first hand about the ramifications and the machinery of American pharmacy, directly from those who are well acquainted with it, the better.

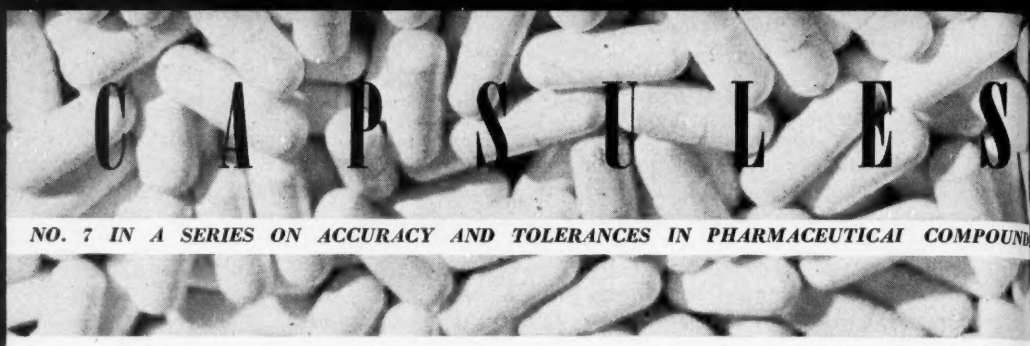
It seems questionable, however, whether meetings of student branch groups should be merged with local branches or district meetings of boards of pharmacy and faculties of colleges of pharmacy. Occasionally it might be well to let a student branch conduct a portion of a meeting of a local branch in the same area. And there is no objection to student branch members meeting with a local branch when the program is outstanding and of interest to students. However, there are many local branch meetings that are devoted to discussion of subjects which do not interest students at some stages of their development. Why bore them by inviting them to such meetings?

The purpose of student branches is to interest young pharmacists in the A. PH. A. at the student level and gradually cultivate in them an abiding interest in the importance of the A. PH. A. to the professional life and welfare of pharmacists, so that A. PH. A. membership will be looked upon by the student who graduates as an asset which he cannot afford to overlook.

Inviting members of student branches to join in the N. A. B. P.-A. A. C. P. district meetings where joint problems of education, examination and licensure are the chief topics of discussion does not seem wise. If a meeting of a district group of student branch representatives is considered desirable, they should meet alone. Of course, they can join their seniors at any entertainment features available, but the effect of heart-to-heart discussions of teaching and testing problems is hardly beneficial to students who still have to finish courses under professors who may be subject to severe criticism by their associates. Nor does it seem wise to invite students, who will be taking state examinations, to listen in on discussions by Board members, who may wish to speak freely about questions and answers and the scope and effectiveness of examinations.

Sociability and friendliness are all right in their place; but one should not carry the idea of meetings with students to the point where they can become a hindrance to the free and frank discussion of technical problems dealing with teaching and testing.

Teachers and state board members can make their best contributions to student organizations by addressing such groups on important topics of the day and discussing the subjects of their addresses with those who ask intelligent questions.



NO. 7 IN A SERIES ON ACCURACY AND TOLERANCES IN PHARMACEUTICAI COMPOUND

by SAMUEL W. GOLDSTEIN*

CAPSULES are generally used in extemporaneous compounding as a means of dispensing unpleasant-tasting, unstable or otherwise unmanageable medicinals. They also serve as a means of dividing the medicinals into convenient dosage units. The increased accuracy achieved in dosage administration in this manner seems obvious when one considers that liquid medicinals are generally directed to be administered in teaspoonfuls. It has been proved that a teaspoonful can vary in different homes from 2 cc. to 7 cc.

It would appear that the most carelessly filled capsules would give the patient a more accurate dosage than a carefully prepared liquid preparation. However, this is only a general observation and cannot be applied to individual cases, because any particular home may have teaspoons and attendants that may combine to give the patient the intended dram of the liquid. It is therefore necessary to judge the accuracy with which capsules are filled as a separate and not a relative problem.

Filling Procedures

The most accurate procedure for filling capsules requires weighing or taring each empty capsule, then inserting the powder or mass until the required weight has been added. There very likely are some pharmacists who do this as a general practice. I know that quite a few use this method to prepare capsules which they know are to be tested by some regulatory authority. However, inquiries and observations lead to the positive conclusion that the great majority of pharmacists do not follow this procedure. Furthermore, in most cases, it hardly seems fair to expect such a degree of precision, with the necessary increase in the time required for the filling operation. Many pharmacists follow the procedure of weighing the first and several other filled capsules in a set, using an empty capsule as a tare.

Of course, there are some pharmacists who select an empty capsule which they assume will hold the desired weight of the medicinal and proceed to pack the required number of capsules. If some of the prepared powder remains, they may add it to the cap portions of some of the capsules, or they may discard it.

Use of one empty capsule as a tare in the filling of a set of capsules introduces some deviation from the required weight because the other empty capsules may be lighter or heavier than the tare. Manufacturers of capsules declare that deviations in the weight of units in the same batch may be of the order of ±3% with the maximum unit deviation being about 10% of the average weight of the empty capsules.

An empty No. 1 capsule weighs about 1.32 gr. A maximum deviation of 10% from this weight would be 0.132 gr., which is equivalent to about 2.6% of the medicinal agent in a 5-grain capsule. H. H. Schaefer[1] reported an average deviation of ±9.2% from the mean weight of 200 No. 1 capsules, with extremes of −9.42% and +14.88%.

J. W. Lee[2] suggested the use of the average weight of a large number of empty capsules as a tare. This has given more accurate results than the use of one empty capsule.

Some pharmacists utilize mechanical aids in filling capsules. The gadgets used are, in most cases, relics from the period when pharmacy was a less hurried profession.

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Some of the other factors influencing the precision with which capsules are filled are:

1. Accuracy in the weighing of the different ingredients.
2. Loss of ingredients in the transfer and mixing process.
3. Loss of the powder in the transfer and filling process.
4. Carelessness at any or all of these stages as well as in checking the weights of the filled capsules.

The factor of loss can be controlled best by preparing more of the bulk powder than is required to fill the requested number of capsules. The factor of carelessness is easily controlled by being careful. The increase in precision obtained by controlling the latter factor is amazing.

A greater degree of precision is to be expected in capsules containing only one ingredient than when a mixture of powders is requested. When only one ingredient is requested, the factors of weighing and mixing before packing are not involved. Nor is there a limited amount of the bulk powder available for filling the requested number of units (as in the case of a mixture). Most of the capsules used in this study are of this type (i.e., a single ingredient). Furthermore, most of the pharmacists who filled these capsules knew that their products were to be tested at the State Board of Health. This should have reduced the factor of carelessness to a minimum. The precision with which these capsules were filled should approach the highest degree of accuracy obtainable in preparing this form of medication at the prescription counter.

Data Obtained

Data obtained from 78 sets of 5-grain phenacetin capsules, prepared by pharmacists in Maryland, are given in Table 1. The data show that the average percentage deviation (A. P. D.) from the total requested weight is ±3.29%. The average of the average percentage deviations of the individual units in each set, from 5 gr., is ±4.01%. Using twice the A. P. D. and twice the average A. P. D. to determine the tolerances, we obtain ±6.58% and ±8.02%, respectively.

Basing the proposed tolerances on a scale increasing by increments of 2.5%, a standard tolerance of ±7.5% would be allowed for the deviation from the total weight. A standard tolerance of ±10% would be allowed for the average unit deviation.

Reasonable Precision

Again we come to the question: How accurately should extemporaneously prepared capsules be filled? A logical answer would be: As accurately as is practicably possible. This should yield dosage units close to the intended doses, assuring the desired therapeutic effect and, in the case of the more toxic medicinals, well within the limits of safety with regard to the patient.

The official compendia set forth standards for capsules prepared by manufacturers. These capsules are prepared in large quantities, and a standard tolerance for the total bulk powder is not essential. The only stated standard is the allowed tolerance in the average unit deviation. This average is achieved by direction in the assay procedure that not less than 20 capsules be taken as a sample. This is also a further indication that the official standards are based on manufactured products with little or no consideration to "small lot" prescription-counter preparations. No official limits are set for deviations of individual capsules. Since most of these capsules are machine-filled under controlled conditions, fairly precise work should be expected.

To check the accuracy of this observation, 19 sets of 5-grain quinine sulfate capsules, purchased by pharmacists and representing the products of at least nine different manufacturers, were studied. The data show that the A. P. D. from the total weight of the medicinal ingredient that should be in the requested number of capsules in each set is ±2.98%. The average A. P. D. of the units of each set is ±4.14%.

Using the same system as that proposed for extemporaneously prepared capsules, the determined tolerance for the average unit deviation would be ±8.28% and the assigned standard tolerance would be ±10%. A comparable official preparation would be ammonium chloride capsules. The tolerance allowed for these capsules is ±5%. All but two of the 19 sets of quinine sulfate capsules would meet a tolerance of ±5%. The two sets of less accurate capsules were prepared by the same manufacturer. It is only fair to state that this manufacturer is

not one of those from whom more precise products are expected. Omission of the three sets of capsules prepared by this same manufacturer would result in a determined tolerance of ±6.44% and an assigned tolerance of ±7.5%. Eighteen sets, or all excepting one of the inferior products, meet this tolerance.

Of the 16 sets considered in arriving at a tolerance of ±7.5%, one set has 2 capsules exceeding a deviation of ±10% and 1 capsule exceeding a deviation of ±15%. One other set has 1 capsule showing a deviation of 10.2%. Of the 78 sets of hand-filled 5-grain phenacetin capsules, 21 sets have one or more capsules exceeding a deviation of ±10%. Seven sets have one or more capsules exceeding a deviation of ±15%. Three sets have one or more capsules exceeding a deviation of ±20%.

The greater accuracy with which smaller capsules can be filled under controlled conditions than at the prescription counter is indicated by a study of 1-grain and 1½-grain digitalis capsules. Thirteen sets of these capsules prepared by three different manu-

TABLE 1—DEVIATION FROM TOTAL WEIGHT AND AVERAGE DEVIATION OF UNITS IN SETS OF 5-GRAIN PHENACETIN CAPSULES

Set No.	*Dev. from Total Weight in %*	*Av. % Dev. of Units from 5 Gr.*	*Set No.*	*Dev. from Total Weight in %*	*Av. % Dev. of Units from 5 Gr.*
1	+ 1.1	2.27	41	− 5.6	5.68
2	+ 6.5	6.50	42	− 1.6	1.70
3	− 3.0	3.50	43	− 3.0	3.30
4	−17.4	17.37	44	+ 7.4	7.32
5	+ 4.1	6.00	45	+ 0.8	2.22
6	+ 2.0	2.07	46	− 2.4	2.34
7	− 6.5	5.41	47	+11.0	10.94
8	+ 1.2	1.68	48	− 2.2	2.58
9	+15.8	15.99	49	+ 3.2	3.02
10	−14.0	13.84	50	+ 0.8	1.90
11	− 1.2	2.60	51	+ 1.8	2.52
12	+ 2.2	2.71	52	+ 6.4	6.36
13	− 1.8	2.22	53	+ 2.8	4.58
14	− 5.7	6.28	54	− 0.6	1.10
15	− 8.3	8.38	55	− 2.8	2.92
16	− 3.0	3.35	56	− 0.4	2.38
17	− 1.5	3.43	57	+ 3.6	4.14
18	− 3.3	3.27	58	− 3.8	3.84
19	+ 0.2	2.72	59	+ 0.4	2.08
20	+ 1.0	1.82	60	− 1.6	2.48
21	− 2.3	3.05	61	+ 0.8	1.26
22	− 1.7	3.05	62	0.0	1.54
23	+ 9.3	10.30	63	− 5.8	5.76
24	− 2.3	2.55	64	− 2.0	2.30
25	+ 2.5	9.80	65	+ 5.2	5.20
26	− 1.5	2.13	66	− 2.6	2.54
27	+ 0.2	0.92	67	+ 1.6	1.94
28	+ 4.2	4.60	68	+ 3.0	3.22
29	− 2.0	2.40	69	+ 2.0	3.28
30	− 1.8	3.07	70	− 0.2	1.72
31	− 6.2	6.60	71	+ 2.0	3.10
32	+ 1.7	1.90	72	− 0.4	2.28
33	+ 1.3	1.78	73	− 0.2	2.06
34	+ 3.5	3.50	74	− 2.8	5.06
35	+ 2.0	4.73	75	+ 3.0	5.96
36	− 0.8	3.05	76	− 3.8	3.86
37	− 1.0	2.18	77	0.0	2.06
38	− 2.4	2.94	78	− 9.5	9.50
39	− 1.4	2.26			
40	− 1.2	3.00	**Totals**	256.2	321.26

Average Deviation from Total Weight 3.29%
Average of the Average Per cent Deviations from 78 Sets 4.01%

facturers show average unit deviations varying from ±2.2% to ±6.4%. Only one set averages over ±6%. None of the individual units in these 13 sets deviates by more than ±12.5% from the mean weight of each set.

Three sets of 1½-grain digitalis capsules were hand-filled by pharmacists. The average unit deviations are ±5.7%, ±6.2% and ±9.1%. All three sets have individual units showing deviations greater than ±15%. Two of the three sets have units deviating by more than ±17.5%.

Fifty 1½-grain pentobarbital capsules from the same lot of a manufacturer's product show an average unit deviation of ±1.68% from the mean unit weight. Only two units show deviations greater than 5% (5.4 and 5.04%), and the next highest deviation is 3.96%.

Separate Standards

It is my opinion that the official standards of tolerance for all classes of pharmaceuticals are based upon products that can be prepared by manufacturers under properly controlled conditions. I believe that an appreciable number of pharmacists can and do compound preparations that meet these official standards most of the time. But to expect all pharmacists to meet such standards in their extemporaneous compounding is to face away from the facts. Furthermore, most of the preparations compounded at the prescription counter are not in the official compendia; and, therefore, no nationally recognized standards exist for them. It now rests with the local or state drug official and the judiciary to decide the proper permissible tolerance. This undesirable situation will continue until separate standards for extemporaneously compounded preparations are included in the official compendia.

The tolerances recommended above apply only to capsules prepared with a single medicinal, which requires no preliminary weighing or mixing operation. A small number of capsules containing more than one ingredient, but which were purchased by individuals unknown to the pharmacists, were reported in the first paper in this series.[3]

A recent group of 10 applicants for State Board certification prepared capsules containing: arsenic trioxide 1½ gr., strychnine sulfate 1 gr., ferrous sulfate 2 drams, lactose ½ dram; to make 30 capsules. The first two ingredients account for only 1.64% of the total weight. For practical considerations this can be treated as a two-component capsule. Eight of the 10 sets showed minus deviations in the total weight, varying from −13.2% to −16.9%. One set showed a positive deviation of +13.7%. The other set showed a minus deviation of −32.5%, with all the units showing fairly uniform weights. Apparently this applicant neglected to use any sort of tare for the empty capsules. The weight of 30 No. 1 capsules would account for 39.6 gr. of the 49.6 gr. deficiency.

All 10 sets had at least 1 unit that deviated by more than ±17.5% from the mean of 5.08 gr. The average A. P. D. for the 10 sets is ±15.95%. This is in fair agreement with the value of 14.2% deviation for a 5-grain two-component capsule (charcoal and magnesia) reported by H. H. Schaefer.[1] He also reported a 16.3% deviation for a 3-grain two-component capsule. J. W. Lee[2] reported that a tolerance of more than 10% should be established for deviations of individual units in any set of capsules. His conclusion was based upon deviations from determined mean weights, and not from the theoretical mean weights of sets of 4-grain, 5-grain and 6-grain capsules. (The basis for such a conclusion is even stronger when the theoretical mean weight is used.) Andrews and DuMez[4] reported an average deviation of 5.47% in 5-grain capsules of sodium salicylate. Their studies also corroborate the assertion that the allowed tolerance should increase as the weight of the capsule decreases. Their results with 2½-grain capsules showed average deviations of 10.95%.

The results reported by Lee and Andrews and DuMez are based upon the work of students, and I have reported results with some State Board examination products. I do not approve of the use of State Board applicants' or students' preparations in deriving tolerances for prescription-counter products. These results are included here for whatever interest they may have.

Discussion

The following tolerances were recommended for capsules in the first paper[3] in this series:

1. *Deviation from Total Weight* ±10%.

2. *Average Unit Deviation* ±10%, with no unit exceeding a deviation of ±15%.

3. *Deviation of Ingredient from the Declared Amount* ±15%.

This later study shows that with single-component 5-grain capsules the first tolerance could be ±7.5% and the second tolerance remains at ±10%. The fact that 9% of the 78 sets of capsules have units deviating by more than ±15% indicates, I believe, that this is not too wide a tolerance. Four per cent of these sets have units deviating by more than ±20%. The third tolerance of ±15% for the ingredient deviation is reasonable for most single-component capsules. Wider deviations in all three types of tolerances will undoubtedly be observed when capsules containing two or more ingredients are studied. Wider average unit-deviations and single unit-deviations will be obtained with capsules containing 2 gr. or less of medicinal.

Much work remains to be done with this class of extemporaneous pharmaceuticals before final reasonable and equitable standards can be established. I believe that the procedure described herein, which is based upon the products of practicing pharmacists possessed of varying degrees of skill and who presumably are doing their best work, will yield reasonable and equitable tolerances. A cooperative effort under the auspices of the AMERICAN PHARMACEUTICAL ASSOCIATION could assure completion of such a project.

Next Month: POWDERS

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BACTERIA, pH, TRAUMA CAUSE ADHESIVE PLASTER IRRITATION

MECHANISM of adhesive plaster dermatitis has been studied by Drs. Peck, Rosenfeld, Li and Glick of Mount Sinai Hospital, New York City. Dermatites produced by two varieties of adhesive tape were compared (one tape containing zinc propionate and zinc caprylate). It was found that the adhesive tape containing fatty acid salts showed much less tendency to produce irritation than the one which did not contain such acid salts.

Adhesive tape containing fatty acid salts tended to adhere more closely to the skin and showed less tendency to develop wrinkles. When removed, the tape did not have a slimy deposit on its under surface.

Alterations of *p*H and of bacterial flora were studied. The average *p*H of normal skin was 5.2. The *p*H under the adhesive giving the greatest irritation rose to 6.3 at the end of seven days. At the end of fourteen days it was 6.7. Under the adhesive which contained fatty acid salts the *p*H rose to 5.7 at the end of seven days and reached 6.7 at the end of fourteen days.

The experiments indicate that bacteria of the skin surface play a role in the irritation produced by adhesive tape. The incorporation of bactericidal and bacteriostatic agents tends to eliminate the type of adhesive tape irritation in which the bacteria play a role. Irritation due to bacteria could be prevented by previous treatment of the skin with fatty acid salts.

The investigators conclude that adhesive tapes produce three types of irritation:

1. A relative unimportant fleeting reaction, which is most marked in hairy areas, is due to the mechanical trauma of removing the tape. This is the more marked, the more firmly the plaster adheres to the skin.

2. A reaction due to specific sensitivity to one or more of the ingredients of the adhesive tape. This is relatively rare.

3. A reaction due to changes in *p*H, and to bacterial flora on the skin surface under adhesive plaster. This is the most common type. Bacteriostatic and bactericidal agents, such as fatty acid salts incorporated in adhesive plaster, can play an important role in preventing this reaction by depressing the bacterial flora.

—*Jour. Invest. Dermatol., 10: 367, 1948*

teropterin and diopterin . . . . . .

EVALUATION OF RESULTS IN TREATMENT OF CANCER ISSUED BY THE A. M. A.'S COUNCIL ON PHARMACY AND CHEMISTRY

RECENT newspaper and periodical publicity regarding "teropterin," stemming from a report by Farber and his coworkers,[1] has again raised the hopes of many sufferers from cancer that a "cure" for this disease has been found. Because of the inquiries received by the Council on Pharmacy and Chemistry, the existing evidence regarding the actions of "teropterin" and an allied derivative, "diopterin," has been reviewed.

Chemically, both "teropterin" and "diopterin" are closely related to folic acid (pteroylmonoglutamic acid); "teropterin" is pteroyltriglumatic acid, and "diopterin" is pteroyldiglutamic acid. Leuchtenberger and his associates[2] observed that "folic acid concentrate" and crystalline *Lactobacillus casei* factor inhibited tumor growth in mice with transplanted sarcoma 180. In another publication[3] these authors reported inhibition of spontaneous mammary cancer in mice with folic acid.

Farber and his co-workers[1] published the first clinical report on the use of "teropterin" and "diopterin" in the treatment of human cancer. They administered these preparations to 90 patients with terminal cancer and noted in some instances a subjective feeling of improvement on the part of the patients and a diminution in pain. No definite beneficial action on the tumors was reported. The authors were chiefly concerned with reporting lack of toxicity due to the drug and noting the subjective effects.

Klainer[4] has reported a case of metastatic adenocarcinoma of the breast treated with "teropterin," but he stated that the reported improvement in the metastatic lesions could not be ascribed to "teropterin," because the patient was also subjected to oophorectomy and injections of testosterone propionate, both of which are known to produce favorable effects on such metastatic lesions.

Lehv, Wright, Weintraub and Arons[5] have described the results of administration of "teropterin" to 20 patients with cancer. These patients were treated for from one to three months with "teropterin" exclusively. Of the objective changes observed, the only one of significance was the tendency to reduction of abnormally high alkaline and acid phosphatase values. Subjectively, relief from pain was observed in most of the patients, and in several instances opiates could be reduced or eliminated entirely. The patients reported a sense of well-being and a state of mental alertness. Five of the patients had died at the time the report was prepared. No objective changes in the malignant lesions were reported.

Meyer[6] has reported that in 7 patients with chronic lymphocytic leukemia, 2 with chronic myeloid leukemia, 2 with multiple myeloma and 1 with acute lymphoblastic leukemia treated for four to ten weeks with "teropterin," no alteration in the blood picture was noted, although some relief from pain and better appetite were recorded.

News stories which have appeared have hinted at possibilities far beyond those set forth in the recorded observations of these investigators. Since it appeared that not all of the available information had yet been published, the manufacturer of these folic acid derivatives was asked if he had information which could be made available to the Council for review. The firm furnished such information, and part of this report is based on data so obtained.

Both "diopterin" and "teropterin" were distributed to at least two hundred and twenty-five investigators, many of whom have reported on only 1 or 2 cases. Data on 154 patients treated with "teropterin" and on 121 patients treated with "teropterin" and "diopterin," which have been furnished the Council, form the basis of this report.

Since, on the basis of the present available data, there is no significant difference in the results of "teropterin" medication as compared with "diopterin" medication, the results will be combined in this report. It is stated that in 31.6% (87 cases) general objective improvement was noted by the attending physician. Unfortunately, many physicians did not record what constituted "general objective improvement" and it is possible that some of this may have been wishful thinking, particularly in view of the fact that several of the patients reported to have "general objective improvement" died within a few weeks.

Certain objective changes in the patient's condition were reported, however, and among these were changes in appetite, weight and anemia. Improved appetite was seen in 31% of the patients, gain in weight in 14.5%, loss of weight in 30.9%, improvement in anemia in 5.1% and increased anemia in 4.7%. It would not be surprising to see some correction of anemia in view of the close relationship of these compounds to folic acid. That more patients failed to improve may be due to two factors: severity of the disease and short duration of medication. The improvement in appetite may, in many instances, be due to psychic suggestion and may be more apparent than real, as suggested by the fact that far fewer patients showed a measurable gain in weight. It should be remembered, however, that many patients with cancer have prodigious appetites but fail to gain weight.

Analgesic Effect Noted

Emphasis has been laid on the reported analgesic action of "diopterin" and "teropterin." If these drugs have a significant analgesic action, much of the reported subjective improvement in patients may be attributable to this effect; of the patients in whom pain was a significant factor, 38% obtained some relief. In this connection, "teropterin" appeared to be significantly superior to "diopterin," since approximately 50% of those receiving "teropterin" reported relief from pain as against 23% receiving "diopterin."

Some of the reported relief may have been of psychic origin, but there is little doubt that much of it was real, since many of the patients receiving opiates were maintained comfortably on greatly reduced dosage or with complete withdrawal of other analgesic medication. It should be pointed out, however, that relief from pain in 50% of the patients is far inferior to the percentage of relief seen following the administration of adequate doses of the opiates alone or in conjunction with other potent analgesics. On the other hand, "teropterin" may offer advantages because of the absence of side reactions and lack of hypnotic or sedative effects.

Action on Lesions Doubtful

Of greatest interest are the reported actions of these compounds on the tumors and their metastases. Of significance, therefore, is the observation that in 81.1% of the patients, no change was noted in either the primary tumor or the metastatic lesions. In 13.1%, regression of the lesions was reported. However, it should be noted that many of these patients were receiving or had received other forms of therapy such as roentgen rays or radium, and it is not possible to attribute the regression to the drug. In other cases, the criteria for determining regression were not stated, or the location of the lesions did not permit an accurate estimation of changes in size. In the few cases which have come to autopsy, no significant effects on the tumor which could be attributed to the drug have been noted.

It is perhaps too early to conclude that either "teropterin" or "diopterin" has an action or, on the other hand, is ineffective in cancer. Too few cases have been observed and the study period has seldom been more than a few months, the majority of those on whom information is available receiving less than eight weeks' treatment and observation. Certainly, no critical appraisal of the effects of an agent in cancer can be made in such a brief period; five years is the usually accepted required period of observation.

In view of the lack of conclusive evidence contained in the data reported to date with these compounds, the Council believes it advisable to emphasize again the need for carefully examining publicity on the results of medical research that has been written for public interest and thus designed to have news appeal. In the minds of many physicians as well as members of the general public the impression has been created that

'teropterin" has been shown to have a definite anticarcinogenic effect. The facts available do not yet support this view; even if the actions of the drug had been proved to be more dramatic than those reported here, much more critical investigative work would seem necessary before hope for a new lead to a cure can be raised.

The Council also believes that some consideration should be given to the manner in which new agents, believed to be useful in the treatment of cancer, are investigated. The indiscriminate distribution of such drugs to physicians regardless of the facilities with which they have to work and their competence in the particular field under investigation actually retards scientific progress, is wasteful of material and is not productive of valuable information. The investigation of new remedies should be entrusted to those who are competent by training and experience to conduct critical clinical trials, who have facilities adequate to study the patients receiving the preparation and who will, in a reasonable time, treat sufficient numbers from which statistically valid data may be obtained.

Frequently, a manufacturer who is still studying the possibilities of a new drug is besieged with requests for it when the first favorable report appears. This creates an awkward situation: The manufacturer may not wish to risk offending the inquiring physician by refusing the drug, but he knows that if the product fails to elicit the desired response he may be blamed; and yet he is also blamed if he refuses the drug. The only solution is for the medical profession to wait until the product has been proved safe and efficacious and for the manufacturer to stand steadfast in his refusal to give it to any but qualified investigators. In the meantime, the manufacturer has been distributing pamphlets by mail and at exhibits in medical, hospital and nurses' conventions.

The Therapeutic Trials Committee has as one of its functions the arrangement of clinical trials of new agents. The work of this committee in organizing a collaborative study on androgens and estrogens in mammary cancer already is setting a pattern for investigations of this type. Such investigations, while time-consuming, are not as time-consuming as piecemeal investigation, and, furthermore, are so exhaustive because of collaboration by experts that the problems and solutions are clearly defined at the end of the investigation.

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METHADON EFFECTS COMPARED TO MEPERIDINE AND MORPHINE

Methadon is about three times as potent an analgesic as morphine and many times more potent than meperidine, according to Drs. E. M. Christensen and E. G. Gross of Iowa City. It lacks sedative properties and undesirable effects are minimal. Methadon may be administered intravenously for rapid onset and short duration of analgesia, or subcutaneously for slower onset and longer action.

Subcutaneous doses of atropine or scopolamine at the usual therapeutic level decreased both intensity and duration of the analgesic effects of methadon and morphine as measured by determination of pain threshold. With meperidine, on the other hand, the duration but not the intensity of the analgesic action was shortened. Neither atropine nor scopolamine produced analgesia, as measured by determinations of pain threshold, when given alone. The use of atropine or scopolamine decreased the undesirable side effects of morphine or meperidine, Drs. Christensen and Gross state. Scopolamine enhanced the sedative effect of the analgesics also.

The study revealed that neostigmine increased both the intensity and duration of the analgesic action of morphine, meperidine and methadon.

Premedication agents should be selected for sedative effects rather than for their analgesic actions, these investigators believe.

Methadon seemed most useful for postoperative pain and for relief of pain from many other causes. Combined with neostigmine it should afford even greater relief for patients who have severe pain.

—J. Am. Med. Assoc., 137: 594, 1948

ELECTRODE JELLIES

An Investigation of Preparations for Possible Use as Conduction Media in Electrocardiography . . Inexpensive Jelly with a Corn Starch Base Was Found to be the Most Suitable of Those Tested

by FRED E. LEHNING,* BYRL E. BENTON and E. R. SERLES

SINCE 1856 it has been known that the contraction of the heart was accompanied by the production of an electrical current. In 1887 Waller[1] demonstrated that this current could lead from the surfaces of the body and be recorded—if proper contact were made by the electrodes of a galvanometer upon any two areas of the body including the heart between them. During these first investigations of what was to become today's electrocardiogram, the success of the instrument depended upon the assurance of proper contact between the body and the electrodes of the machine.

The contacts were made by using jars of strong salt solutoins, each hand and the left foot being immersed in a separate container. Later, cloth pads wet with salt solution, to which the electrodes were connected, afforded the medium for proper contact.

With the advancement of the science of electrocardiography, a better means of obtaining a medium for conduction was needed, and consequently a formula for electrode jelly was introduced.[2] Little, if any, literature has been published on the subject.

The purpose of the electrode jelly is to furnish a medium capable of improving the conduction of the electrical potential of the heart muscles, from the surface of the skin to the connecting electrodes, without too much variation or loss of current.

Katz[2] suggested the following formula for a suitable electrode jelly:

Sodium chloride..	1460 Gm.	3¼ lbs.
Pumice powder..	1800 Gm.	4 lbs.
Gum tragacanth.	110 Gm.	4 oz.
Potassium bitartrate.....	56 Gm.	2 oz.
Glycerin.....	336 Gm.	12 oz.
Water, to make..	4 L.	1 gal.

This formula has proved useful. However, the following investigations were carried out to find a substance more suitable and less expensive than tragacanth for the preparation of electrode jellies.

Our objective was to replace tragacanth in the formula with various substances and otherwise to revise the formula where experience indicated. Characteristics of the new preparation were determined on patients at the University of Illinois Research Hospital.

The following substances were investigated as to their efficiency and convenience as a base in the preparation of an electrode jelly: methyl cellulose, bentonite and corn starch. Katz's formula and a saturated salt solution, as well as formulas developed by the University of Illinois Research Hospital's Pharmacy, were also investigated.

It was found that any medium which affords the proper concentration of salt provides a constant current flow.

The most satisfactory results, from the substances investigated, were obtained by using corn starch as the substitute for tragacanth. This preparation affords a good medium for the salt solution and does not appear to be as irritating to a patient's skin as jellies containing tragacanth. There is very little residue left on the patient's skin after using the starch jelly and, although slightly sticky, there is little if any coating left on the electrodes of the machine. If such coatings occur, they can be removed easily with a little alcohol or water. The jelly is very inexpensive to manufacture, and its consistency makes dispensing in tubes practical.

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Presented to the Section on Practical Pharmacy, AMERICAN PHARMACEUTICAL ASSOCIATION, 1947 meeting, Milwaukee.

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The following method of preparation was used in all formulations, unless otherwise specified. Ribbon tragacanth or its substitute was weighed out and placed in a suitable wide-mouth container. The sodium chloride and preservative were dissolved in boiling water, and poured over the tragacanth and stirred well. When the preparation began to form a gel, the pumice was incorporated into the gel by using a mechanical mixer. The mixture was allowed to stand for several days in order that the formation of the gel would be complete and then, if necessary, strained through cheese cloth.

The University of Illinois Research Hospital Pharmacy's formula for electrode jelly was prepared, used, and found satisfactory. Our formula is somewhat similar to Katz's suggested formula and is as follows:

Tragacanth ribbons	70
Sodium chloride	920
Water, distilled	2600
Glycerin	200
Pumice	200
Methyl *p*-hydroxybenzoate	4

Procedure: Dissolve the methyl *p*-hydroxybenzoate and sodium chloride in warm water. Add this solution and the glycerin to the tragacanth in a suitable wide-mouth container. Add the pumice and mix thoroughly. Let the preparation stand for a few days with occasional agitation to allow the formation of a gel. Then mix mechanically and strain.

In comparison with the formula as suggested by Katz, it will be noted that potassium bitartrate has been omitted and that methyl *p*-hydroxybenzoate has been added. The efficiency of the Illinois Research Hospital Pharmacy's formula was not affected by this omission.

Other Formulas

Other formulas prepared were as follows: (1) original Illinois Research Hospital Pharmacy's formula deleting the pumice and adding potassium bitartrate; (2) original Illinois Research Hospital Pharmacy's formula plus potassium bitartrate. In testing these on patients, the first formula indicated gave a slight variation in current flow. This can be explained by the lack of an irritant in the preparation, such as pumice, which aids in the lowering of skin resistance. This is shown by the degree to which the string tension must be reduced to obtain the proper deflection of the string for standardization. With such a loose string tension an unsteady and sluggish record is obtained.

A third formula was prepared by increasing the percentage of tragacanth. This resulted in too viscid a preparation and was considered undesirable.

Experiments with Methyl Cellulose

Methyl cellulose has been suggested as a good substitute for tragacanth.

It is stated that any of the several commercially available viscosity brands of methyl cellulose, which occur in dry, fibrous masses, will produce a stable jelly when dissolved in distilled water at normal temperatures, and that such a jelly serves as an excellent dispersion medium for water-insoluble substances.[3] To prepare a solution quickly, ten to fifteen parts of boiling water are added to one part of methyl cellulose, the mixture is stirred thoroughly until the mass swells and the lumps dissolve. After cooling it is strained through unbleached muslin and diluted to any desired viscosity.[4,5,6]

Solutions of methyl cellulose, and products in which methyl cellulose is incorporated, are harmless to man and other animals, when applied internally or externally.[3] The substance is resistant to marked changes in *p*H.[3]

Methyl cellulose has been used to replace tragacanth, karaya gum or sodium alginate in the manufacture of pastes, and it is compatible with alkaline fatty acids, sulfates, neutral soaps, chlorates and perborates. Bergy[3] has suggested a formula for a depilatory using 5% methyl cellulose solution as the base. He also suggested that because of the variation of the viscosity of the methyl cellulose, it may be necessary to increase or decrease the amount of solution necessary to formulate a paste of desired consistency.

With the above factors in mind, gels of methyl cellulose were made to determine the percentage concentration which would present the most suitable consistency for electrode jelly. A 2% solution of methyl cellulose, 1500 cps. viscosity type, gave a consistency of about that of glycerin, which was too fluid for the desired use. It was found that a 4 to 5% solution would give the desired viscosity.

The problem was to manufacture a jelly containing methyl cellulose (in place of tragacanth) and a saturated salt solution. This preparation was attempted using the following formula:

Methyl cellulose (1500 cps. viscosity), 5%*	12.5
Water, distilled	250.0
Sodium chloride	88.4
Glycerin	15.0
Methyl *p*-hydroxybenzoate	0.38

Procedure: Dissolve sodium chloride and methyl *p*-hydroxybenzoate in boiling water. Place methyl cellulose in a dry wide-mouth container and add the solution of sodium chloride. Then add the glycerin and stir with a glass rod until thoroughly mixed.

The methyl cellulose did not go into solution, and a gel was not formed. An attempt was then made to prepare a solution of the methyl cellulose first, adding to it the salt solution. The methyl cellulose was immediately salted out. The methyl cellulose solution was again prepared and salt in granular form was added, with the hope that the methyl cellulose would remain in solution. However, the same phenomenon occurred. Even when one particle of salt was added the methyl cellulose immediately surrounding that particle of salt was thrown out of solution. Potassium chloride was then used in place of sodium chloride but the same conditions were found to prevail.

It was therefore concluded that it would be impossible to use methyl cellulose for the medium in which to incorporate a concentrated solution of sodium chloride.

Bentonite Tested

Bentonite was next considered as a substitute for tragacanth, even though it is insoluble and leaves an excessive residue on the surface of the skin. The following preparations were investigated. The formula for magma of bentonite was used as a basis of manufacture and preparation.

I.

Bentonite	10.0
Water, distilled	100.0
Methyl *p*-hydroxybenzoate	0.2

Dissolve the methyl *p*-hydroxybenzoate in hot water and add the bentonite. Stir until a paste is formed.

*Pharmaceutical Grade, from Dow Chemical Co.

The above 10% preparation was of good consistency and would appear to be suitable as a base for electrode jelly.

II.

Bentonite	10.0
Water, distilled	100.0
Methyl *p*-hydroxybenzoate	0.2
Sodium chloride	29.0

Dissolve the methyl *p*-hydroxybenzoate and sodium chloride in hot distilled water and add to the bentonite. Mix well, making a gel.

Using formula II, the preparation was not a gel as would be expected, but a fluid mixture with the bentonite dispersing but not swelling as it normally does. A 15% bentonite suspension was made to determine the possibility of obtaining a gel when a higher concentration of bentonite was used. This also gave a fluid preparation.

The method of preparation was then reversed in that the bentonite magma (10%) was made by adding water to the bentonite and stirring until a gel was formed; then the sodium chloride was added directly to the preparation, using a mortar and pestle. This resulted in a stable preparation of a gel consistency, seemingly suitable for use as an electrode jelly.

Failure of the bentonite to form a magma was quite unexpected; however, it has been shown numerous times that a reversal of procedure will give varying results, such as in the preparation of calamine lotion using bentonite. Unless the magma is made first and then the other ingredients added, the bentonite will not form a gel.

The preparation as described above was tested and proved satisfactory in the limb leads of the electrocardiogram; however, very poor conduction was obtained in the CF_5 lead.

The undesirable feature of excessive residue on the patient's skin was also observed. The residue was sufficient to be considered undesirable, even though there was little, if any, irritation to the patient's skin.

Starch has long been used as a basis for pastes and jellies. One publication suggests "the following formula for preparing a glycerin jelly, which may be varied by substituting agar-agar, gelatin, tragacanth, *starch*, or quince seed for the Irish Moss here directed: Boil 15 Gm. of chondrus with sufficient distilled water to make 420 cc. of

a strained liquid; while still warm dissolve in this 80 Gm. of glycerite of boroglycerin and when nearly cold add any desirable perfume or flavor. The boroglycerin may be replaced by glycerin, wholly or in part."[7]

The advisability of using starch as a possible base for electrode jelly was at first considered doubtful, because of the possibility of its drying out and becoming lumpy after preparation and storage. However, because starch is unaffected by salt, and since it affords the proper consistency in small concentrations, and is inexpensive, the investigations were carried out.

The following formula was used in preparing the jelly:

Glycerin	5
Starch	10
Sodium chloride	29
Water, distilled	100
Methyl *p*-hydroxybenzoate	0.2
Pumice	5

(Formula for four, 4-oz. tubes)

Procedure: Make a paste of the starch by adding 20 cc. of cold distilled water and stir until smooth. Add the sodium chloride, the methyl *p*-hydroxybenzoate and the glycerin to the remainder of the water. Mix the two solutions, add the pumice, heat to boiling, stirring until a uniform paste is formed.

It is unnecessary to let the starch paste stand for any length of time or to strain it before using. It should be stored in tightly closed containers at room temperature, as higher temperatures will cause the paste to dry out. Temperatures of 40° C. will cause the exposed surface to become rubbery. The preparation under the exposed surface, however, is not affected. It should be placed in tubes while still warm.

Clinical Results

To obtain clinical evaluation of the starch electrode jelly, it was used on fifty patients at the University of Illinois Research Hospital.* A cross section of different types of patients was selected. These included obese, undernourished, ill, and normal persons of both the white and colored races. There were, of the colored race, both light and dark skinned patients, which gave an excellent opportunity for tests on patients with very high skin resistance.

Of all the patients tested, not one gave results that could be considered unreadable, and only three patients gave anything but excellent or good results as to conductivity and standardization.

Two of these patients were negroes, one of whom weighed 496 lbs., and the other had very dark, tough skin. In such cases, it is normally expected that there will be some difficulty in obtaining even fair standardization and conduction; however, with the use of starch electrode jelly readable results were obtained.

Another case which presented difficulty was that of an older white woman who was undernourished and had a thyrotoxic goiter. She weighed only 90 lbs., and the flesh was hard, tough and edematous. Here the conduction was poor, but standardization was sufficient for a readable tracing.

A patient was tested who had previously produced a very low voltage when an electrocardiogram reading was taken, using an electrode jelly of a tragacanth base. Subsequently starch electrode jelly was used on the same patient, and very good conduction with rapid standardization resulted.

Conclusions

Attempts were made to prepare a suitable electrode jelly using tragacanth ribbons, methyl cellulose, bentonite and corn starch as the base. Jellies of suitable consistency were tested on patients at the University of Illinois Research Hospital.

The corn starch electrode jelly prepared, as indicated in the preceding formula, was found to be the most suitable as well as the least expensive of all preparations investigated. It is being successfully used at the University of Illinois Research Hospital.

* The electrocardiograms for this work were taken by Miss Jean Wilson, Senior Laboratory Assistant in the Department of Medicine, University of Illinois College of Medicine.

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Origin of the term CALOMEL

by George Urdang

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PHARMACEUTICAL nomenclature is a subject in itself. In early times there were fancy names mirroring concepts of fear or faith and often destined to conceal rather than to reveal the real nature of the drug concerned. There have been names hinting at some particular mode of preparation or pointing to the purpose for which the drug was to be used. As the last step in the development, there are the names derived from, and telling as distinctly as possible, the composition of the drug. Finally, there is undoubtedly some national preference in the various countries for the one or the other term, and even for the one or the other way of using the Latin language to construct the terms for official products.

Mercurous chloride offers examples of all these various concepts responsible for the naming of drugs. The concept of fear finds its expression in the term *draco mitigatus*, the dragon which, fortunately, had been tamed. A particular process of preparation—in this case, sublimation—was picturesquely intimated by the name *aquila alba*, meaning the white sublimation product that, eagle like, ascends. The idea of telling the therapeutic purpose was expressed in the title *panchymagogum minerale*, meaning a mineral product capable of purging away all sorts of humor (from the Greek $\pi\alpha\nu$ = all, $\chi\upsilon\mu os$ = juice, and $\alpha\gamma\omega$ = I drive away).

For the type of names mirroring the differences and changes in the chemical concepts underlying them, mercurous chloride may well be regarded as a kind of state witness. As to national preferences, finally, one has only to point to the Anglo-Saxon inclination to use the name of the metal, as *genetivus partitivus*, followed by another noun telling the special nature of the compound. This is exemplified by the term

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This paper represents part of a broader study of the early chemical and pharmaceutical history of calomel by the author. Other aspects of his research are reported in Volume I of *Chymia*, annual studies in the history of chemistry, of which Dr. Urdang is a consulting editor.

One of the earliest references to "calomel" appears as "calomelanos Turqueti," which is associated with the name of Sir Theodore Turquet de Mayerne, pictured at left. From its logical use to designate de Mayerne's blackish product, the term calomel—meaning beautiful black—later was incongruously applied to strikingly white mercurous chloride itself.

hydrargyri chloridum mite in the present edition (XIII) of the *Pharmacopoeia of the United States*.

On top of that, there is the fancy name which, in the course of time, has superseded all other names for mercurous chloride in popularity: *calomel*, called also *calomelanos* and *calomelas*.

Its origin and meaning have remained an unsolved problem through the ages.

For the time up to 1840, A. J. L. Jourdan[1] listed the following Latin names used for mercurous chloride in pharmaceutical nomenclature at one period or another:

(1) *antiquartium*, (2) *aquila alba seu mitigata*, (3) *calomelanos*, (4) *chloretum hydrargyri seu hydrargyrosum*, (5) *draco mitigatus*, (6) *hydrargyrum muriaticum dulce seu mite*, (7) *manna metallorum*, (8) *mercurius dulcis seu mitis seu muriaticus seu praecipitatus albus seu sublimatus dulcis*, (9) *murias hydrargyri oxydulati seu mitis seu suboxygenatus seu hydrargyrosus mitis seu oxyduli hydrargyri mitis*, (10) *panchymagogum minerale*, (11) *panchymagogum quercetani*, (12) *protochloruretum hydrargyri*, (13) *submurias hydrargyri seu hydrargyri mitis seu praecipitatus seu sublimatus*.[2]

In Geiger[3]-Mohr's[4] *Pharmacopoeia Universalis*, issued five years later, the following additional terms were mentioned:

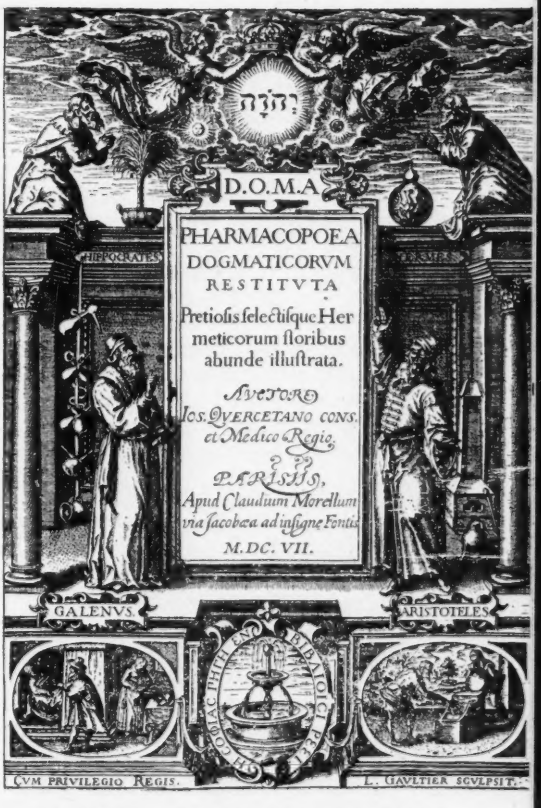
(1) *calomelas*, (2) *chloruretum hydrargyri*, (3) *corallinum album libavii*, (4) *filius majae seu quercetani*, (5) *hydrargyrum chloratum*, (6) *hydrochloras oxyduli hydrargyri mitis*, (7) *murias protoxydi hydrargyri*, (8) *panacea mercurialis*.[5]

According to Hirsch[6] the following terms for mercurous chloride were used in official pharmaceutical standards about 1890:

chloretum hydrargyri sublimatum (Denmark), *chloretum hydrargyrosum* (Holland), *chloretum hydrargyrosum mite* (Norway), *hydrargyri chloridum mite* (U. S. A.), *hydrargyrum chloratum* (Germany), *hydrargyrum chloratum mite* (Switzerland), *hydrargyrum chloratum mite sublimatione paratum* (Austria, Hungary), *hydrargyrum muriaticum mite* (Greece).[7]

In the British pharmacopoeia the respective term was at that time *hydrargyri subchloridum* and in the French *Codex* of 1884, *chloruretum hydrargyrosum*. The Swedish pharmacopoeia of 1926 called the preparation *hydrargyri chloridum* and the Spanish standard of 1926, *hydrargyri protochlorurum*.

There is practically nothing known about the origin of the term *calomel*. Neither its exact derivation, nor even the time in which



Joseph du Quesne, latinized as Quercetanus, is said to have been one of the first to employ calomel. The illustration shows the title page of his "Pharmacopoea Dogmaticorum Restituta." One of the early titles for mercurous chloride, sublimed six or seven times, includes his name: Aquila alba Quercetani, the "white eagle of Quercetanus."

1. Antoine Jacques Louis Jourdan (1788–1848), French physician, author of a *Pharmacopée Universelle* and a dictionary of scientific terms.
2. A. J. L. Jourdan, *Pharmacopée Universelle*, 2nd ed., Paris, 1840, v. II, p. 43.
3. Philipp Lorenz Geiger (1785–1836), German apothecary-chemist, discoverer of several alkaloids.
4. C. Fr. Mohr (1806–1879), German apothecary-chemist, known especially for his enrichment of the apparatus used in volumetric analysis and his book on pharmaceutical technique.
5. P. L. Geiger-C. Fr. Mohr, *Pharmacopoea Universalis*, part II, Heidelberg, 1845, p. 146.
6. Bruno H. G. Hirsch (1826–1903), German apothecary-chemist specializing in literary work concerning pharmacopoeias.
7. B. Hirsch, *Universal Pharmakopoea*, v. I, Leipzig, 1887, p. 866.

it was put into circulation has been determined with any degree of certainty. The great historian of chemistry, Hermann Kopp, deals briefly with the problem, and in a somewhat annoyed fashion, as follows:

"As to the inadequate [Kopp uses the German term "unpassend"] designation Calomel (from the Greek καλομελας = beautiful-black), all I am able to say is that it came into use in the first half of the last [the eighteenth] century (from England ?), and that then the Calomel of the English (seven times sweetened mercury) was distinguished from the Calomel of the French (three times sublimated or common sweetened mercury)."[8]

"A Touch of Indecent"

Since "unpassend" has the meaning of inadequate with a touch of indecent, the use of this word by Kopp characterizes his feelings toward the term calomel. The question mark attached by him to his suggestion of the English origin of its use for mercurous chloride may well be dropped. That it was the British isles from where the term calomel, as a designation for just this product, has spread all over the world, is almost the only thing of which we are comparatively sure in this obscure matter.

There was, however, no "calomel of the French" different from the "calomel of the English." When, in the second half of the eighteenth century (not in the first half as assumed by Kopp), the term gradually was adopted internationally, its meaning as a differentiating designation for a preparation sublimated at least seven times (as contrasted with the common mercurous chloride sublimated only three or four times) was on its way out. Even at the end of the time to which H. Kopp refers, *i.e.*, the first half of the eighteenth century, the term calomel was used in England somewhat indiscriminately for all kinds of mercurous chloride.

As the designation for a mercurous chloride that had been sublimated seven times the term made its first official appearance in the *Pharmacopoeia Edinburgensis* of 1699. There, under the time-honored heading *mercurius sublimatus dulcis*, the well-known formula for the sublimation of a mixture of four parts of corrosive sublimate and three parts of mercury is given, the product thus obtained to be sublimated another two or three times. Then, however, something new appears. To the old formula this note is attached: "Si ad sextam vicem iteretur operatio, vocatur Calomelas, et Aquila alba" (= If the operation [sublimation] be repeated six times, the preparation is called *calomelas* or *aquila alba*).

The idea that repeated sublimations of mercurous chloride render a more refined product had been almost as old as the preparation itself. At the end of the formula for *mercurius dulcis*, to be prepared by sublimation, as listed in the second issue of the *Pharmacopoeia Londinenois* of 1618, the opinion already had been voiced that "the more often the procedure [of sublimation] is repeated the more perfect a medicament emerges." Hence it was to be expected that some day there would emerge the idea to discriminate between such a more perfect medicament, for which naturally a higher price could be asked, and the common product. The materialization of this idea was, naturally, based on two presuppositions: the fixation of a minimum amount of repeated sublimations, guaranteeing the better product, and a special name distinguishing the latter from the common one.

In Search of Origins

The author of the note in the *Pharmacopoeia Edinburgensis* of 1699 quoted above offered two names for the product of seven subsequent sublimations: *calomelas* and *aquila alba*. While the term *aquila alba* was a well-established one used earlier and later for all kinds of mercurous chloride, that was not the case with the term *calomelas*. The simultaneous limitation of the old term to the seven-times sublimated product only, and the presentation of a new term for the same purpose, makes it likely that they were derived from one and the same source.

A fortunate finding confirmed this assumption. There appeared at London in 1677 a book entitled *Medicinal Councels or Advices* bearing the author name Turquet de Mayerne.[9] On pages 134 and 135 of this book, which was undoubtedly known to the well-versed author of the formula for

8. Hermann Kopp, *Geschichte der Chemie*, v. IV, Braunschweig, 1847, p. 192; the above translation is this author's (G. U.).

mercurius sublimatus dulcis in the *Pharmacopoeia Edinburgensis* of 1699, the following is said:

"(Advice in the Epilepsia, or Falling Sickness: For a Noble Virgin. Written in French, by a Physician whose Name is not known.) . . . ℞ *Aquilae albae Quercetani*, that is the white eagle of Quercetanus;[10] which is, *Mercurius Dulcis*, six or seven times sublimed, gr. xv. Rosin of Scamony, gr. v. Wrap it up with a little pulp of a roasted Apple artificially, and so take it . . . The Chymical Medicine consisting of *Quercetani Aquila alba*, and Rosin of Scamony, or its Extract prepar'd with Spirit of Wine, according to Schroeder,[11] is the *Calomelanos Turqueti* . . ."[12]

Definite Proof

Here we have definite proof of two facts not ascertained previously, hence not to be found in the historical literature concerned. First, there was as early as 1677, and very likely even earlier, a tendency to use the term *aquila alba* as a discriminating designation for *mercurius dulcis* sublimated at least six times. That it was a tendency rather than an accepted custom becomes evident by the consistent use of the term as one of the names for the common product (*i.e.*, the one sublimated three or four times) in the early annotated translations of the *Pharmacopoeia Londinensis* into English. These had appeared in rapid sequence since, in 1649, the notorious Nicolas Culpeper[13] published the first one. Of still greater historical interest is the reference to *calomelanos turqueti* as the designation for a compounded drug consisting of mercurous chloride six or seven times sublimated and of "rosin of scamony" or its extract.

The correspondence between the passage in the book of 1677 and the concluding part of the formula for *mercurius sublimatus dulcis* in the *Pharmacopoeia Edinburgensis* of 1699 is so striking that there can hardly be any doubt that the former served as the basis of the latter. The decisive step taken by the man in Edinburgh was his presentation of the term *calomelas* as the designation for the seven times sublimated product as such, *i.e.*, without any admixture. In giving this term—with its change or limitation of meaning—first place in the note concerned, he made it clear that he personally preferred, and wanted others to prefer, this term to the other one presented at second place, *i.e.*, *aquila alba*. His success proves the effectiveness of this psychological trick.

Thus the time and the way in which the term calomel (*calomelas*, *calomelanos*) became the designation for a special kind of mercurous chloride seem, at long last, to be ascertained. Simultaneously the confusing or, as Hermann Kopp had put it, "unpassend" fact of a term meaning beautiful-black for a preparation whose whiteness is one of its obvious characteristics, finds a plausible explanation. The product to which it had been given originally, the *calomelanos turqueti* was undoubtedly blackish and was thought to have beautiful (in the meaning of wonderful) qualities.

A Century Later

Almost a century after the appearance of the first *Pharmacopoeia Edinburgensis*, William Lewis[14] in his *New Dispensatory* said the following: "In grinding *mercurius* (*dulcis*) with volatile spirits, it becomes blackish, and this perhaps is the true calomel."[15] In the preparation of the mixture of mercurous chloride and an alcoholic extract of scammony, called *calomelanos turqueti* in the *Medicinal Councels or Advices* issued in 1677, exactly this procedure, namely the grinding of mercurous chloride with "volatile spirits," was applied. Thus Lewis certainly was closer to the truth than he himself expected.

The author of *Gray's Supplement to the London Pharmacopoeia*, the first edition of which appeared in 1812, refers to a prepara-

9. Sir Theodore Turquet de Mayerne (1573–1665) was the first of several French physicians and pharmacists who, being Protestants and Paracelsists, sought refuge in England. He was responsible for the chemical part of at least the first edition of the *London Pharmacopoeia* of 1618.

10. Joseph du Quesne, latinized Quercetanus (1544–1609), French physician and Paracelsist. He is said to have been one of the first to employ calomel.

11. Johann Christian Schroeder (1600–1664), German physician, author of one of the most used encyclopedic pharmaceutical reference books, called *Pharmacopoea Medico-Physica*. An English translation was published in 1669 under the title *The Compleat Chymical Dispensatory*.

12. For the discovery of this passage this writer is indebted to Dr. Dorothy H. Schullian, Curator of Rare Books, Army Medical Library, Cleveland Branch, who took the trouble of searching through, for respective references, all the books designated by him.

13. Nicolas Culpeper (1616–1654), a self-taught English "student of physics," as he calls himself in one of his books, author of a very popular herbal.

14. William Lewis (1714–1781), English physician and chemist, author of *The New Dispensatory* and books on materia medica and practical chemistry.

15. *The New Dispensatory*, London, 1781, p. 518.

tion of similar composition called "the calomel of Rivierus."[16] Dr. Ribbitz de la Riviere, latinized Rivierus, was a fatherly friend of Turquet de Mayerne and both cooperated.[17] It is therefore quite possible that this composition and its name were the common property of both men, hence could rightly be called after the one as well as the other. Mr. Gray expressed the opinion that this "calomel of Rivierus may have been the first application of the term, meaning a mixture of a white and dark substance."[18] He does not offer any evidence for the way in which the term calomel became the designation for mercurous chloride as such.

Some Interesting Guesses

As to earlier suggestions concerning the origin of the term calomel, the following passage from A. C. Wootton's *Chronicles of Pharmacy*[19] offers a good summary:

"A fanciful story of a black servant in the employ of de Mayerne manufacturing a beautiful white medicine is told by Pereira[20] with the introduction 'as some say.' A good remedy for black bile is another farfetched etymology, and another conceives the metal and the sublimate in the crucible as blackish becoming a fair white . . . In Hooper's *Medical Dictionary* it is plausibly guessed that the name may have been originally applied to Ethiops Mineral and got transferred to the white product."

Finally, Wootton refers to the idea, advanced by readers of the English journal *The Chemist and Druggist*, that the term calomel goes back to καλος = beautiful and μελι = honey, forming a sort of rough translation of dulcified mercury. Another guess, to be found in chemical and medical dictionaries, traces the name back to the change of color from white to black if calomel is treated with ammonia.

Of all these guesses only that referring to "Ethiops" (*Aethiops mineralis* = mercuric sulfide) gains some semblance of possibility from the fact that this product was first prepared by Turquet de Mayerne and is as black as possible. There is, however, no substantial evidence in its support as has been offered for the solution advanced above.

It has been pointed out before that the term calomel lost its distinguishing meaning as designation for a special kind of mercurous chloride (*i.e.*, sublimated seven times) comparatively early and became the generally used term for all kinds of mercurous chloride in whatever way prepared. It was for this reason that the *Pharmacopoeia Londinensis* of 1746 and the *Edinburgensis* of 1756 dropped the term entirely. Referring to the London standard, R. James commented on this fact as follows:

"The College [London College of Physicians] have here drop'd the Distinction betwixt *Mercurius dulcis* and calomel, as of very little Consequence; because the Chymists have long neglected this Distinction and sold the same Preparation for both . . "[21]

Half a century later, in 1788, the term calomel appeared again in the *Pharmacopoeia Londinensis*, this time as the official heading of the formula for the common (*i.e.* four times sublimated) *mercurius dulcis sublimatus*. This fact meant undoubtedly a recognition of the popularity that this designation had been able to achieve. Besides, however, it was due to the desire to avoid the pitfalls of a decision for the one or the other contemporary (and possibly merely temporary) chemical concept. When in 1841 the *Pharmacopœia Edinburgensis* still used the term calomel as the heading of the formula for mercurous chloride, instead of adopting a designation significant of the supposed chemical constitution of the latter, Franklin Bache said the following:

"We would be sorry to share the opinion of the Edinburgh College that the adoption of the modern chemical nomenclature, to express pharmaceutical substances, was a great error, on account of its liability to change. Systematic nomenclature belongs to science, and its change is the inevitable consequence of the progress of the latter."[22]

The history of terms used for mercurous chloride, and especially of the term calomel, testifies to the importance of drug names for understanding better the concepts of their originators as to substances that these names were to designate.

16. Ribbitz de la Riviere, Parisian physician of Swiss birth, influential in French medicine in the late sixteenth and the early seventeenth centuries.
17. George Urdang, *Pharmacopoeia Londinensis of 1618*, Madison, 1944, p. 20.
18. A. C. Wootton's *Chronicles of Pharmacy*, London, 1910, v. I, p. 420.
19. *Ibid.*, pp. 419, 420.
20. Jonathan Pereira (1804–1855), renowned English pharmacognosist, author of a well-known text on materia medica.
21. R. James, *Pharmacopoeia Universalis or a Universal English Dispensatory*, London, 1747, p. 823.
22. *The Dispensatory of the United States*, 1843, p. 979.

The 26th Remington Medalist

ANDREW G. Du MEZ

ANDREW G. DuMEZ of Baltimore, secretary of the American Council on Pharmaceutical Education and dean of the University of Maryland School of Pharmacy, has been named the twenty-sixth Remington Medalist. In announcing selection of Dr. DuMez, the Committee on Award indicates that this distinction will be conferred "specifically as a recognition of his services as secretary of the American Council on Pharmaceutical Education," although "his general prominence in the fields of education and research also qualifies him as a recipient of the medal." The award is made by the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, and the 1948 presentation ceremonies are expected to be held in New York City sometime this fall.

The gold medal commemorates Joseph P. Remington, universally known pharmacist who was chairman of the U. S. P. Revision Committee for several decades and made many contributions to research, education and pharmaceutical literature. The honor is conferred upon the person whose work during the preceding year, or culminating over a period of years, is judged most important to American pharmacy by the Committee, which consists of past presidents of the AMERICAN PHARMACEUTICAL ASSOCIATION.

In referring to the achievements of Dr. DuMez, the Committee on Award pointed out that "few men in the pharmaceutical field have been so consistently devoted to the advancement of pharmacy. None has been more resolute in opposition to any and all schemes that would impair its professional and ethical standards. Dr. DuMez's work as secretary of the American Council on Pharmaceutical Education," it was emphasized, "not only greatly improved the educational programs in colleges of pharmacy, but has encouraged highly constructive changes throughout the field of pharmaceutical education."

The 1948 Remington Medalist was born and reared in Wisconsin and attended the University of Wisconsin, where he graduated in pharmacy (Ph.G.) in 1904. The following year he was appointed instructor in pharmaceutical chemistry at the University, a post he held until 1910. During this period he acquired the Bachelor of Science and Master of Science degrees. He

then was called to Pacific University (Oregon), where he served a year as professor of chemistry, and the next year taught chemistry at Oklahoma Agricultural and Mechanical College. Dr. DuMez then journeyed to Manila where he served as director of the School of Pharmacy at the University of the Philippines from 1912 to 1916.

Here he was appointed by the Vice-Governor of the Philippine Islands to investigate its colleges of pharmacy. On appointment by the Director of Health, Dr. DuMez also served as a member of the committee to revise pharmacy and drug laws of the Islands.

Government Posts

Upon returning to the United States, he accepted the Hollister Fellowship at the University of Wisconsin, earning a Ph.D. degree in 1917. At that time an appointment to the U. S. Public Health Service took Dr. DuMez to Washington, D. C., as associate pharmacologist in the Hygienic Laboratory. While with the government, he authored, from 1918 to 1922, the annual "Digest of Comments on the Pharmacopoeia of the United States and the National Formulary," published by the U. S. Public Health Service. In 1918 he was appointed by the Secretary of the Treasury as a member and secretary of the Special Committee to Investigate the Traffic of Narcotics in the United States. The Secretary of State, with approval of the President, appointed him official delegate of the United States Government to the Second Conference on the Unification of Standards for Potent Remedies, which convened in Brussels, Belgium, in September, 1925.

Dr. DuMez left the Public Health Service in 1926 to accept his present post as dean of the University of Maryland School of Pharmacy.

The twenty-sixth Remington Medalist has been a member of the U. S. P. Committee of Revision from 1920 to date, and for a decade (1930–1940) was its vice-chairman. During this entire period, since 1920, he has been serving with distinction as chairman of the U. S. P. Subcommittee on Nomenclature.

Since establishment of the American Council on Pharmaceutical Education in 1932, he has served as secretary-treasurer, being primarily responsible for meticulous analysis of records of performance by all colleges of pharmacy, supervision of inspection schedules, formal rating of colleges, and the diplomatic task of dealing with educational authorities of all ranks.

Dr. DuMez has been president of both the AMERICAN PHARMACEUTICAL ASSOCIATION and the American Association of Colleges of Pharmacy, and is currently vice-chairman of the National Pharmaceutical Survey Committee. He was a consultant to the War Manpower Commission in 1942 and last year received appointment as pharmacy consultant to the Surgeon General of the U. S. Army.

Dr. DuMez is a life member of the AMERICAN PHARMACEUTICAL ASSOCIATION, and in addition to the presidency (1939–1940) has served as chairman of the Scientific Section (1920–1921), member of the Council for two decades (1920–1941), and as Council secretary (1920–1923). In addition, Dr. DuMez was editor of the "Year Book of the American Pharmaceutical Association" from 1921 to 1935, editor of its *Pharmaceutical Abstracts* from 1935 to 1940, and editor of the *Scientific Edition* of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION in 1940 and 1941. Dr. DuMez has also contributed frequently to pharmaceutical, chemical and public health periodicals, such as the *U. S. Public Health Reports*, JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, *Journal of the American Medical Association*, *American Journal of Pharmacy* and the *American Journal of Pharmaceutical Education*. He is co-author of "Quantitative Pharmaceutical Chemistry" and an advisory editor and one of the co-authors of "American Pharmacy."

Affiliations

The professional affiliations of Dr. DuMez include the American Chemical Society, American Public Health Association, American Association for Advancement of Science, AMERICAN PHARMACEUTICAL ASSOCIATION, Maryland Pharmaceutical Association (of which he has been honorary president) and the Wisconsin Academy of Science, Arts and Letters. He is also a member of Sigma Xi, Rho Chi, Phi Delta Chi, Kappa Psi, Kiwanis, and is a member of the Masonic Lodge.

ADJUSTED COLLYRIA

. . . the effect on ph of variations in technique, equipment and grades of chemicals

by WILLIAM J. HUSA* and JACK K. DALE†

IN DISCUSSING ophthalmic buffer solutions, Hosford and Hicks[1] stated that: "It is unfortunately not practical to hand over the formulas worked out by Gifford and Smith[2] to the average druggist and get solutions of the desired *p*H value. The factors of error in making them up under such conditions are too great." Other writers have advocated the preparation of ophthalmic buffer solutions by use of an analytical balance, calibrated volumetric equipment, C. P. or reagent-grade chemicals and other refinements of technique.

The purpose of the present investigation was to determine the degree of error in *p*H introduced by variations in grades of chemicals, use of ordinary prescription balance and other variations in technique.

Experimental

All *p*H determinations were made with a Beckman, Model G, glass electrode *p*H meter at room temperature.

Effect of Drying the Chemicals.—To determine if it is necessary to dry reagents for buffer solutions, 0.2 and 0.4 molar solutions were made up from samples of boric acid (*a*) taken directly from the container, (*b*) dried over sulfuric acid for eighteen hours, and (*c*) dried at 110° C. for four hours. Solutions of similar strength were prepared from samples of anhydrous and monohydrated sodium carbonate (*a*) taken directly from a freshly opened container, (*b*) oven dried for four hours, and (*c*) in the case of the anhydrous salt, taken from a container that had been opened four years previously.

Solutions 0.05 molar were prepared from samples of sodium borate anhydrous and decahydrate (*a*) taken directly from a freshly opened container, (*b*) oven dried for four hours, and (*c*) in the case of the decahydrate, taken from containers in use for at least six months.

As would be expected, the *p*H of these simple solutions showed that drying had no significant influence on the *p*H. An exception was oven-dried boric acid, where it was believed that decomposition and formation of metaboric acid decreased the *p*H [see last column of Table I].

Further tests on Gifford's and Feldman's buffers prepared from these same samples showed that drying of the substances did not appreciably affect the *p*H of the finished buffer, if adjustment was made in the formulas for differences in water of crystallization. The results shown in Tables I and II (page 422) seem to indicate it is unnecessary to carry out special drying of these buffer chemicals provided they have been kept in tightly closed containers. Gifford's alkaline buffer solution prepared from monohydrated sodium carbonate (24.8 Gm./L.) gave results corresponding to those obtained with an equimolar solution (0.2 molar) prepared from the anhydrous salt (21.2 Gm./L.) [see Table II].

Effect of Grade and Brand of Chemicals.—The *p*H of 0.4 molar solutions of three brands of reagent grade boric acid and three brands of the U. S. P. grade was 4.33 ± 0.02 for all samples. In case of borax the *p*H of 0.1 molar solutions of two brands of reagent grade and three brands of

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TABLE I.—EFFECT OF DRYING ACID-BUFFER CHEMICALS ON *p*H VALUES OF FELDMAN BUFFER MIXTURES

Method of Drying Salts: (Boric Acid and KCl)	Undried Salts	Salts Dried 18 Hours Over Sulfuric Acid	Salts Oven Dried 4 Hours 110° C.
Cc. Alkaline Buffer[a] per 20 Cc. Acid Buffer[b]	*p*H of Solutions		
0	4.89	4.85	4.52
0.1	6.02	6.02	5.62
0.5	6.33	6.33	5.93
1.0	7.03	7.02	6.68
2.2	7.38	7.39	..
5.2	7.82	7.82	..

[a] Sodium borate decahydrate ($Na_2B_4O_7.10H_2O$) 19.07 Gm., distilled water *q. s.* 1000 cc.
[b] Boric acid 12.368 Gm., sodium chloride 2.925 Gm., distilled water *q. s.* 1000 cc.

U. S. P. grade was 9.24 ± 0.01 for all samples.

Further experiments were conducted to compare the *p*H values of Gifford's[3] and Feldman's[4] buffer solutions prepared with different grades and brands of chemicals. The results showed that either U. S. P. or reagent grades were satisfactory, as the variations did not exceed ± 0.05 *p*H unit in any case. Typical results are given in Table III.

TABLE II—EFFECT OF DRYING SODIUM CARBONATE ON *p*H VALUES OF GIFFORD BUFFER MIXTURES

Cc. Alkaline Buffer[a] for 30 cc. Acid Buffer[b]:	0.58	1.40	2.85
Method of Drying Sodium Carbonate	*p*H of Solutions		
Non-dried freshly opened monohydrated sodium carbonate (24.8 Gm./L.)	6.95	7.38	7.78
Non-dried freshly opened anhydrous sodium carbonate (21.2 Gm./L.)	6.94	7.37	7.78
Oven dried anhydrous sodium carbonate (21.2 Gm./L.)	7.00	7.41	7.82
Anhydrous sodium carbonate prepared by oven drying monohydrate (21.2 Gm./L.)	6.98	7.39	7.80
Previously opened anhydrous sodium carbonate (21.2 Gm./L.)	6.99	7.41	7.81

[a] Sodium carbonate (dried according to table) 0.2 molar.
[b] Boric acid 12.4 Gm., potassium chloride 7.4 Gm., distilled water *q. s.* 1000 cc.

NOTE: With reference to Tables I and II, all chemicals used were of U.S.P. grade except anhydrous sodium carbonate, which was C. P. grade, there being no official grade of this salt.

Effect of Accuracy in Weighing.—To ascertain how accurately Gifford's acid buffer materials must be weighed, determinations were made of the *p*H of solutions prepared by weighing on prescription balances and analytical balances. Using a Class A, box type, prescription balance and U. S. P. chemicals, the *p*H of a number of solutions was 4.83 ± 0.18, while with an analytical balance and U. S. P. chemicals the *p*H was 4.91 ± 0.05. This relatively wide variation in pH of the acid buffer is due to the fact that boric acid cannot exert a buffer effect in the absence of appreciable quantities of its salts.

Results indicating that the prescription balance is suitable for use in preparing Gifford's buffer mixtures are given in the last four columns of Table IV. Other tests have likewise shown that the mixed buffers of *p*H 6.1 or higher do not show a tenth as much variation as the acid buffer which showed variations over a range of 0.4 *p*H units.

Effect on *p*H of the Water Used.—Six Gifford's acid buffer solutions were prepared, two of which were prepared using distilled water (*p*H 5.75), two using redistilled water (*p*H 5.75) and two using recently boiled redistilled water (*p*H 6.80). Since the *p*H of all these solutions was 4.86 ± 0.04, it appears that slight variations in the *p*H of the distilled water have no appreciable effect on the *p*H of these acid buffer solutions. Table IV indicates further that the *p*H of the water used has no appreciable effect on *p*H values of Gifford's buffer mixtures.

Effect of Making Solutions Molar or Molal.—In regard to Gifford's and Feldman's buffer solutions, there has been some difference of opinion as to whether the chemicals are to be dissolved in 1000 cc. of water (molal type solution) or dissolved in sufficient water to make 1000 cc. of solution (molar type solution). Gifford's and Feldman's buffer solutions were prepared by both methods and in each case the difference between the molal and molar type solutions did not exceed 0.02 *p*H unit, thus indicating

TABLE III—EFFECT OF GRADE AND BRAND OF MATERIALS ON *p*H VALUES OF FELDMAN'S BUFFER MIXTURES

Cc. Alkaline Buffer[a] Added per 20 cc. Acid Buffer[b]:		0.0	0.1	0.2	0.5	1.0
Grade of Salts	Manufacturer	*p*H Value of Solution				
U. S. P.	A	4.85	5.95	6.30	6.72	7.02
	B	4.87	6.01	6.32	6.73	7.05
	C	4.85	6.02	6.33	6.73	7.06
Reagent	A	4.84	5.99	6.33	6.75	7.06
	B	4.89	6.02	6.33	6.73	7.03
	C	4.82	6.01	6.32	6.72	7.05
Average of all grades and brands:		4.85 ±0.04	5.98 ±0.05	6.32 ±0.02	6.73 ±0.02	7.04 ±0.02

[a] $Na_2B_4O_7 . 10H_2O$ 19.07 Gm., distilled water *q. s.* 1000 cc.
[b] Boric acid 12.368 Gm., sodium chloride 2.925 Gm., distilled water *q. s.* 1000 cc.

that either method is acceptable. Typical results are shown in the first and third columns of Table IV.

Effect of Dilution on *p*H.—Dilution of Gifford's acid buffer solution and his buffer solution of *p*H 7.1 with an equal volume of distilled water (*p*H 5.9) caused an increase in *p*H of 0.3 unit in each case. Similarly, dilution of Feldman's acid buffer solution and buffer solution of *p*H 7.0 with an equal volume of distilled water raised the *p*H 0.3, unit, but a comparable dilution of the alkaline buffer lowered the *p*H by 0.02 unit.

Revised Gifford's Buffer Mixtures.—Careful *p*H measurements with the glass electrode *p*H meter have given results on Gifford's buffer mixtures which differ from the results in Gifford's papers[2, 3] and from those given by other sources[5] by several tenths of a *p*H unit in some cases. The differences may be due to the use of less accurate colorimetric methods in earlier work. Table V shows the revised proportions for mixing the acid and alkaline buffers to get various *p*H values.

For preparing quantities of about 30 cc., it is necessary to use pipettes graduated in hundredths of a cc. to get sufficient accuracy. In making quantities of about 300 cc., it would be satisfactory to measure the solutions to the nearest tenth of a cc.

TABLE IV—EFFECT OF VARIATIONS IN PREPARATION PROCEDURE OF GIFFORD'S ACID BUFFER ON THE *p*H VALUES OF MIXED BUFFER SOLUTIONS

Solution type:	Molar	Molar	Molal	Molar	Molar	Molar
Balance used:	Anal.[c]	Anal.	Anal.	Anal.	Rx.[d]	Rx.
Grade of salt:	C. P.	C. P.	C. P.	U. S. P.	C. P.	U. S. P.
Water used:	Dist.[e]	R. B. D.[f]	Dist.	Dist.	Dist.	Dist.
*p*H of water used:	5.75	6.80	5.75	5.75	5.75	5.75
Cc. Alkaline Buffer[a] per 100 cc. Acid Buffer[b]	*p*H Values of Mixed Buffer Solutions					
0.0	4.86	4.82	4.84	4.91	5.10	4.90
0.2	6.12	..	6.11	6.10	6.12	6.11
2.0	7.01	7.02	7.03	7.01	7.02	7.02
4.0	7.36	..	7.38	7.35	7.37	7.37
5.2	7.49	7.49	7.50	7.48	7.49	7.50

[a] Sodium carbonate (anhydrous) 21.2 Gm., distilled water *q. s.* 1000 cc.
[b] Boric acid 12.4 Gm., potassium chloride 7.4 Gm., water—as in table *q. s.* 1000 cc.
[c] Anal. = Chainomatic balance.
[d] Rx. = Class A box type prescription balance.
[e] Dist. = Distilled water.
[f] R. B. D. = Recently boiled distilled water.

TABLE V—REVISED GIFFORD'S BUFFER MIXTURES

Proportions to Be Mixed		
Cc. Acid Buffer[a]	Cc. Alkaline Buffer[b]	*p*H of Mixture
30.0	0.04	6.0
30.0	0.08	6.2
30.0	0.13	6.4
30.0	0.22	6.6
30.0	0.28	6.7
30.0	0.35	6.8
30.0	0.46	6.9
30.0	0.58	7.0
30.0	0.74	7.1
30.0	0.92	7.2
30.0	1.14	7.3
30.0	1.40	7.4
30.0	1.69	7.5
30.0	2.02	7.6
30.0	2.40	7.7
30.0	2.85	7.8

[a] Boric acid 12.4 Gm., potassium chloride 7.4 Gm., distilled water 1000 cc.
[b] Sodium carbonate (anhydrous) 21.2 Gm., distilled water 1000 cc.

Revised Feldman's Buffer Mixtures.—Palitzsch[6] introduced a series of borate buffers in connection with studies of sea water. Some of these buffers were adopted for ophthalmic use in 1937 by Feldman.[4] Palitzsch's acid buffer was described as 0.2 *M* boric acid and the alkaline buffer as 0.05 *M* sodium borate, but he used 11.0 as the atomic weight of boron and the accepted value has since been changed to 10.82. Palitzsch's buffers were thus actually slightly higher in molarity than he reported. In the present study we have used the molecular weights of the U. S. P. XIII, which lead to the following formulas. The figures given differ slightly from those recently published by Hind and Goyan,[7] who used the molecular weights of the U. S. P. IX. No significant differences in the *p*H values will be observed, however, using either the U. S. P. IX or U. S. P. XIII molecular weights. If only approximate *p*H values (plus or minus one-tenth *p*H unit) are desired, the figures can be rounded off to the nearest tenth of a gram.

Feldman's Acid Buffer Solution

Boric acid.....	12.368	Gm.
Sodium chloride.....	2.925	Gm.
Distilled water, *q. s.*....	1000.	cc.

Feldman's Alkaline Buffer Solution

Sodium borate ($10H_2O$)	19.07	Gm.
Distilled water, *q. s.*....	1000.	cc.

Using these solutions, *p*H measurements were made on various mixtures. The original results of Palitzsch are in agreement with our measurements made with the *p*H meter. However, some erroneous results were introduced into the literature by Feldman and other writers. Table VI presents the revised proportions for mixing Feldman's acid and alkaline buffers to get *p*H values in the range 7.0 to 8.2, inclusive.

Discussion

The results demonstrate that ophthalmic buffers of satisfactory accuracy can be prepared using prescription balances, U. S. P. chemicals and ordinary distilled water. Slight differences in the concentrations of the buffer solutions do not affect the *p*H appreciably because of the buffer action which tends to stabilize the *p*H.

In preparing Gifford's alkaline buffer solution it would be preferable to use 24.8 Gm. of monohydrated sodium carbonate U. S. P. in place of 21.2 Gm. of anhydrous sodium carbonate. The official form of the salt is more stable and more available in the average pharmacy.

If the U. S. P. grades of boric acid, sodium borate, sodium chloride, etc., are satisfactory in purity for general use in collyria, it follows that they are also sufficiently pure for use in ophthalmic buffers. If any of these U. S. P. chemicals can be shown to be harmful in the eye due to impurities allowed under present official standards, the standards should be raised.

The practical usefulness of a buffer system is usually limited to a range of about 4

TABLE VI—REVISED FELDMAN'S BUFFER MIXTURES

Proportions to Be Mixed		
Cc. Acid Buffer	Cc. Alkaline Buffer	*p*H of Mixture
95.0	5.0	7.0
94.0	6.0	7.1
93.0	7.0	7.2
91.0	9.0	7.3
89.0	11.0	7.4
87.0	13.0	7.5
85.0	15.0	7.6
82.0	18.0	7.7
80.0	20.0	7.8
76.0	24.0	7.9
73.0	27.0	8.0
69.0	31.0	8.1
65.0	35.0	8.2

*p*H units. In general the best buffer capacity is obtained when the concentrations of the weak acid and its salt are approximately equal. Borate buffers have their best buffer capacity over the range of *p*H 7 to 11. Gifford's and Feldman's buffer solutions are somewhat lacking in buffer capacity in the range of *p*H 5 to 7.

To prepare collyria adjusted to the osmotic pressure of the tear secretion, the quantity of sodium chloride or other substance to be added can readily be calculated by the osmotic factor method, freezing point method or sodium chloride equivalents.[8]

It has been common practice to make isotonic collyria by adjusting to the same osmotic pressure as a 1.4% sodium chloride solution, which has a freezing point of −0.80° C. However, evidence has been accumulating that the osmotic pressure and freezing point of the tear secretion are the same as that of the blood.

Thus in 1930, Ridley[9] determined the freezing point of tears and reported a value of −0.551° C. This figure is in accordance with a recent report of Krogh, *et al.*[10], that the lacrimal fluid is equivalent in osmotic concentration to a 0.90% solution of sodium chloride, which has a freezing point of −0.56° C. Hind and Goyan[7] recently reported that contact lens solutions of optimum wearing qualities have a freezing point of −0.54°.

Summary

1. Ophthalmic buffers of satisfactory accuracy can be prepared using prescription balances, U. S. P. chemicals and ordinary distilled water. It is unnecessary to use analytical balances, C. P. chemicals or distilled water from which the CO_2 has been driven off.

2. Careful *p*H measurements with the glass electrode *p*H meter have shown that some of the values given in the literature for Gifford's and Feldman's buffer solutions are appreciably in error. Revised figures are given for the proportions in which acid and alkaline buffers should be mixed to give desired *p*H values.

3. In preparing Gifford's alkaline buffer solution it is preferable to use 24.8 Gm. of monohydrated sodium carbonate U. S. P. in place of 21.2 Gm. of anhydrous sodium carbonate, because the official form of the salt is more stable and more available.

4. Evidence has been accumulating to the effect that isotonic collyria should have a freezing point of −0.56° C. rather than the previously accepted value of −0.80° C.

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ALL STATES BUT TWO AGAIN TAKE VA PHARMACY CONTRACTS

Pharmaceutical associations in 46 states, the District of Columbia and Hawaii have renewed contracts with Veterans Administration to provide "home-town" prescription service for eligible veterans during the fiscal year ending June 30, 1949, E. B. Geiger, of VA's Pharmacy Division, announced.

All states except Nevada and Virginia now are taking part in the drug program.

Under the "home-town" prescription service plan, eligible veterans must:

1. Receive medical treatment for a service-connected illness or disability.

2. Obtain a prescription from a private physician, dentist or osteopathic physician operating under VA's "home-town" medical care program or on a fee basis. (Osteopathic physicians may write prescriptions for veterans only in those states where they are permitted to do so by law.)

The "home-town" pharmacy program, started in the spring of 1946, was designed to reduce reported delays that arose when all prescriptions from fee-basis physicians had to be mailed to the nearest VA office and then sent to the veteran by mail.

DIETARY REQUIREMENTS

In Pregnancy and Lactation

STRIKING changes in normal physiologic processes during pregnancy and lactation impose heavy demands on the mother. How she, or the fetus, may be affected in various ways by faulty nutrition—even when traditional signs of malnutrition are lacking—has only recently been clarified. This has been recorded in the complex literature of nutrition, and is now summarized and evaluated by Prof. Bertha S. Burke and Dr. Harold C. Stuart, of Harvard University School of Public Health, at the request of the A. M. A.'s Council of Foods and Nutrition (*J. Am. Med. Assoc.*, 137: 119, 1948).

Two of the broadly significant factors in nutritional deficiency in the maternal organism are the impairment of digestion and absorption, particularly in early pregnancy; and the elevation of nutritional requirements in late pregnancy and during lactation.

The result of these factors being coupled with a poor diet was dramatically demonstrated by studies in war-torn countries of Europe, where a significant increase was noted in abortions, premature births, still births and neonatal deaths. The women in groups with supplemented and good diets not only had healthier babies, but they themselves proved to be better obstetric risks. They suffered fewer complications, such as toxemia, during labor, delivery and the postpartum period. The quality of the diet also appeared to influence the ability of the mother to nurse her infant.

Studies indicated about 50% of the women in Holland suffered from amenorrhea, due in part to protein deficiency, and were presumably infertile during the hunger months, these workers reported. This condition disappeared promptly with the return of food.

The nutritional allowances for pregnancy (fourth through ninth months) as recommended by the Food and Nutrition Board of the National Research Council are given in the following table:

Nutritional Essentials	*Normal*	*Pregnancy, (4th–9th Month)*	*Lactation*
Calories*	2100	2500	5000
Protein (Gm.)	60	85	100
Calcium (Gm.)	0.8	1.5	2
Iron (mg.)	12	15	15
Vitamin A (I. U.)	5000	6000	8000
Ascorbic acid (mg.)	70	100	150
Thiamine (mg.)	1.1	1.8	2
Riboflavin (mg.)	1.5	2.5	3
Nicotinic acid (mg.)	11	18	20
Vitamin D (I. U.)	....	400–800	400–800

* Energy requirements vary with activity, size of the person, etc.

Ideally, women should be taught prior to marriage that it is important to enter pregnancy in a well-nourished state.

The increased energy requirement during pregnancy is due to increased basal metabolic rate from about the fourth month. This calls for an increased food intake and slight gain of 20 to 25 pounds above the ideal normal weight for height, age and build.

The protein allowance recommended by the Food and Nutrition Board of the National Research Council for the latter half of pregnancy (as indicated in the table) is 85 Gm. daily, corresponding to about 1.5 Gm. per kilogram of body weight. This represents an increase of 40 to 50% above normal. It is emphasized in the Harvard report that many women do not eat a diet rich enough in protein even for their normal needs and it is necessary to encourage them to change their habits appreciably during pregnancy. From the standpoint of protein, the pregnant woman should understand the importance of one quart of milk daily (32 Gm. of protein), at least one-fourth pound of lean meat (24 Gm. of protein) and an egg or its equivalent daily (6 Gm. of protein). A potato and at least four servings of bread and cereal foods, along with the other foods essential to a well-

balanced diet, will furnish the additional 20 to 25 Gm. of protein.

These authors point out that it has been known for a long time that calcium and phosphorus requirements are considerably increased during pregnancy, if the mother's own stores are to be maintained and the fetal needs met. While the exact requirement for calcium is not known, studies have shown that 1.5 Gm. of calcium daily during the latter half of pregnancy apparently allows sufficient calcium to meet the needs of the baby and also permits sufficient storage of calcium in the mother for the needs during lactation.

The phosphorus requirement is thought to be somewhat higher than that for calcium and is probably in the neighborhood of 2 Gm. during the latter part of pregnancy. When protein and calcium needs are cared for, adequate phosphorus will usually be supplied, because phosphorus occurs in ample amounts in protein-rich foods.

Vitamin D appears to aid in the utilization and retention of these two minerals. A total of 400 to 800 international units daily has been recommended.

These authors stress the fact that many women today enter pregnancy with low calcium stores and with poor food habits in regard to calcium-rich foods, namely, milk and its products. One quart of milk furnishes 1.2 Gm. of calcium, and only approximately 0.3 Gm. can be obtained from other foods in the usual diet. Thus, a quart of milk should be incorporated into the cooking or drinks during the day.

The daily iron allowance of 15 mg., suggested for the latter months of pregnancy, assumes that the woman enters pregnancy with a normal hemoglobin level—which physicians find is not always the case. Anemia during pregnancy is quite common, and it is generally accepted that the hemoglobin level is affected by diet. A major cause of anemia of early infancy may be insufficient iron stores *in utero*, resulting from maternal anemia during pregnancy. Food sources rich in iron include lean meat, liver, egg, potato, fruit (especially dried fruits), vegetables (especially greens and legumes), whole grains or enriched breads and cereals.

The vitamin A requirement of pregnancy is not known accurately. The recommended allowance of 6000 I. U. represents an arbitrary increase over normal adult requirements. Foods rich in this vitamin are whole milk, eggs, butter, leafy greens or deep yellow vegetables. Liquid petrolatum should not be used as a laxative or in salad dressing, especially during pregnancy, since it dissolves vitamin A and often "washes" it out of the gastrointestinal tract. Abnormalities of the eyes and other tissues, due to vitamin A deficiency, have been known to develop during pregnancy.

Need for B Vitamins

Prof. Burke and Dr. Stuart point out that approximately three times as much thiamine is required during the last trimester or so than under normal conditions. The suggested optimum thiamine requirement is about 3 mg. daily. Polyneuritis of pregnancy has been recognized by various workers as due to a partial deficiency of this important vitamin. Foods rich in thiamine are milk, lean meat, vegetables, especially legumes and potato, whole grain or enriched bread and cereal.

The recommended daily allowance of riboflavin for the latter part of pregnancy is 2.5 mg. Adequate amounts of riboflavin are considered important in periods of rapid growth and development, since this vitamin plays such an important role in intermediary metabolism. Milk furnishes the major part of riboflavin in the diet. Liver, dark leafy green vegetables and lean meat are also good sources of this vitamin. Symptoms of cheilosis, corneal vascularization and angular stomatitis have been noted frequently by physicians in poorly nourished women during latter pregnancy.

Little is known about the exact requirement of nicotinic acid consumption for humans, although 18 mg. daily is the recommended level. Lean meat, liver, legumes, potato, whole grain or enriched bread and cereal are good sources of this vitamin.

Pyridoxine (vitamin B_6) is mentioned as a possible agent in the prevention of severe nausea and vomiting of pregnancy.

The ascorbic acid requirement has been shown to be increased considerably during the latter stages of pregnancy, and fetal scurvy has been reported in the literature. The recommended allowance of 100 mg. of ascorbic acid daily is supplied by 8 ounces of unstrained orange juice, or by proper amounts of other foods rich in this vitamin, such as tomatoes, grapefruit, raw cabbage,

raw or properly cooked leafy green vegetables or potatoes cooked in the skin.

Vitamin E is of interest for its possible relation to habitual abortion, although this vitamin has never been proved to be essential to man. The possibility of deficiency in the average human diet is remote.

Since vitamin K is so widely distributed in foods and is also synthesized by bacteria in the intestinal tract, a deficiency in the mother is unlikely under normal conditions. However, the newborn infant has been shown to have a very low store of this vitamin, and hemorrhagic disease of the newborn has been associated with this deficiency. Whether or not the prescribing of vitamin K by physicians has materially reduced the incidence of intracranial hemorrhage at birth is considered still uncertain.

The energy requirement and protein requirement during lactation may be increased materially above the normal requirements. The calcium and phosphorus requirements are also elevated during lactation, but the iron requirement probably is not increased and may be even lower than during pregnancy, since little iron is lost in the breast milk.

Vitamin requirements during lactation are not precisely known but are considered to be higher than normal.

To assure an optimum diet throughout lactation, it is believed that the mother should have an additional pint of milk, liberal amounts of vegetables and fruits (especially citrus fruit) while she is nursing.

Pharmaceutical Survey Report Ready Soon

AFTER two years of work the Pharmaceutical Survey will soon issue its final reports. As the Survey director, Dr. Edward C. Elliott, prepared to make three important addresses on his findings at the annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION and related groups, he released the topics of conclusions now receiving final evaluation.

Among the proposals being considered by the national Committee on The Pharmaceutical Survey and its subcommittees are:

(1) the establishment of a commission on pharmaceutical manpower;

(2) the preparation and regular publication of a national roster of American pharmacists;

(3) the holding of a national convention on pharmaceutical legislation;

(4) the creation of a full-time executive officer for the American Council on Pharmaceutical Education to be known as the Commissioner of Pharmaceutical Education;

(5) the qualitative classification of accredited colleges of pharmacy; ways and means for the improvement and the increase in the number of qualified members of faculties of the colleges of pharmacy;

(6) the establishment of teaching fellowships for the purpose of enabling individuals of ability and professional promise to become especially fitted for teaching service;

(7) the increased utilization of intelligence and aptitude tests, and of guidance and counseling services by colleges of pharmacy for the purpose of insuring better quality of students;

(8) the better organization, functioning and support of state boards of pharmacy;

(9) the complete reorganization of the prevailing system of examination for licensure by state boards;

(10) the radical improvement of the administration of practical experience for licensure, otherwise its abolition;

(11) the responsibility of pharmaceutical commerce and industry for the adequate financing of the professional training institutions of pharmacy;

(12) concentrated and organized efforts for the betterment of the existing four-year curriculum of the colleges of pharmacy;

(13) plans for the extension to six years of the period of education and training for fully qualified professional pharmacists with the degree of Doctor of Pharmacy.

Since the beginning the Committee in general charge of the policies, procedures and results of the Survey has held eight meetings of two days each. A special Editorial-Screening Subcommittee has been engaged in a careful review of the first group of the findings and recommendations. These will be presented for final action at a meeting to be held on September 26–27.

The Editorial-Screening Subcommittee, consisting of Dr. George D. Beal, Commander W. Paul Briggs, Dean A. G. DuMez, Dr. Robert L. Swain, Dr. Frank O. Taylor, and Dr. E. L. Newcomb, met on July 12–13, giving its main attention to the findings of the prescription study based upon a comprehensive analysis of more than 13,000 present-day prescriptions; and to the proposals relating to the modifications of the program of education and training in the colleges and schools of pharmacy.

Solubility of Phenol in Liquid Petrolatum

by MITCHELL J. STOKLOSA*

IN THE official monograph on phenol, the United States Pharmacopœia states that phenol is "soluble" in liquid petrolatum.[1] The descriptive term "soluble" means that from 10 to 30 parts of solvent are required to dissolve 1 part of solute.[2] Referring to phenol, the term indicates that 1 Gm. of phenol is soluble in from 10 to 30 cc. of liquid petrolatum.

Pharmacopœial statements concerning solubilities are intended primarily as information required by physicians and pharmacists in connection with the prescribing and dispensing of medicines. It is evident that the interpretation of the descriptive term mentioned above has led practitioners to the belief that phenol is soluble in liquid petrolatum to the extent designated by the official statement. Physicians have prescribed solutions of phenol in liquid petrolatum in percentage strengths falling within these limits only to be informed that a physical incompatibility has been introduced. Pharmacists, in attempting to prepare such solutions, have encountered the problem of dissolving the phenol and keeping it in solution in the concentrations based on the official expression of its solubility.

This investigation was undertaken, therefore, in an attempt to determine the solubility of phenol in liquid petrolatum and light liquid petrolatum and to use the constant as a basis for a more nearly accurate descriptive term for this degree of solubility.

Experimental

Two series of samples were prepared.

SERIES I.—In an attempt to obtain a saturated solution of phenol in liquid petrolatum, 10 Gm. of phenol and 150 cc. of liquid petrolatum were placed in a 250-cc. Erlenmeyer flask, which was fastened upright in a constant temperature bath maintained at 25° C. The mixture in the flask was stirred by a mechanical stirrer. After a two-hour period of stirring, a portion of the clear, supernatant liquid was withdrawn and designated as Sample A. The mixture in the flask was then stirred for an additional period of one hour. After the second period of stirring, another portion of the clear, supernatant liquid was withdrawn and designated as Sample B.

SERIES II.—Two samples of phenol in light liquid petrolatum were prepared according to the procedure outlined in Series I. These were designated as Samples C and D.

As indicated by the results of colorimetric assays in the table which follows, there was no appreciable difference in the phenol content of the samples obtained after a two-hour period of stirring and those obtained after an additional period of stirring.

The several samples prepared in Series I and II were kept at a temperature of 25° C. since crystallization of phenol occurred in all of them at a temperature of about 20° C.

The method chosen for the assay of the phenol solutions was a colorimetric one, a modification of the phenol assay reported by G. Denigés.[3] To determine the accuracy of this method, several phenol solu ions of known concentration were assayed by the Pharmacopœial method and by the colorimetric method. The results of the assay substantiated the accuracy of the method chosen for this experimental work.

Preparatory to the colorimetric examination, 10 cc. of each sample was placed in a separatory funnel, and the phenol was completely extracted from the liquid petrolatum by shaking with a 1% aqueous solution of glycerin. Bromine test solution was used in testing for complete extraction. The final volume of the glycerin-water solution was adjusted, in each case, to 100 cc. Solutions containing 100, 150, 200, 500 and 1000 mg. of phenol per 100 cc. were prepared as standards.

One cubic centimeter of the glycerin-water solution was diluted to 10 cc. with a 1% aqueous solution of glycerin. Three cubic centimeters of this solution were placed in a test tube, and 6 cc. of Millon's reagent and 0.6 cc. of acetic acid were added. The tube was immersed in boiling water for five minutes, cooled, and compared with the standards treated in the same manner. The standard containing 150 mg. of phenol per 100 cc. was chosen for the colorimetric comparison. The results of the colorimetric

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assays of the samples of Series I and II are shown in the table which follows.

Sample	*Colorimeter Reading, mm.*	*Color Intensity, %*	*% of Phenol in Sample*
Standard / 150 mg. per 100 cc.	15.0 / 15.0	100.0	..
A	15.0 / 16.5	91.5	1.37
B	15.0 / 15.1	99.3	1.49
C	15.0 / 16.9	88.8	1.33
D	15.0 / 16.8	89.3	1.34

Calculation:

$$\frac{\text{Reading standard}}{\text{Reading unknown}} \times \text{mg. in std.} \left(150 \times \frac{100}{10}\right) = \text{Gm. phenol per 100 cc. of sample}$$

The foregoing results seem to indicate that, at a temperature of 25° C., the solubility of phenol in liquid petrolatum is approximately 1.49% and in light liquid petrolatum approximately 1.34%. The correct descriptive term for this degree of solubility is "sparingly soluble." It is recommended, therefore, that the Pharmacopœial Revision Committee consider the adoption of this term for designating the solubility of phenol in liquid petrolatum.

Summary

1. Samples of saturated solutions of phenol in liquid petrolatum and light liquid petrolatum were prepared.

2. Measured portions of the several samples were extracted with a 1% aqueous solution of glycerin and these solutions were assayed colorimetrically.

3. Results of the colorimetric assays seem to indicate that the solubility of phenol in liquid petrolatum is approximately 1.49% and in light liquid petrolatum approximately 1.34%.

4. Adoption of the descriptive term "sparingly soluble" for designating the solubility of phenol in liquid petrolatum is recommended.

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THIRD INSTITUTE ON HOSPITAL PHARMACY

THE Third Institute on Hospital Pharmacy again demonstrated the dedication to high professional service and the determination to maintain a distinguished specialty that have become characteristic of hospital pharmacy meetings. A capacity attendance of 135 hospital pharmacists met in Princeton, N. J., on June 28 for the five-day program of lectures and demonstrations by a special faculty. The 66 men, 32 Sisters and 37 other women represented hospitals in 31 states, Canada and the Dutch West Indies.

This third Institute was again sponsored jointly by the American Hospital Association, AMERICAN PHARMACEUTICAL ASSOCIATION and American Society of Hospital Pharmacists. After all-day meetings the hospital pharmacists re-convened each night with the faculty for panel discussions and extended question periods.

A panel discussion and demonstration on time-saving devices for hospital practice, held Wednesday night under the chairmanship of Herbert L. Flack of Jefferson Medical College Hospital, appeared to be of special interest to those attending. Many slides and actual pieces of ingenious equipment were shown as aids in more efficient operation of hospital pharmacies.

The five-day session was opened on Monday afternoon by Dr. Robert P. Fischelis, secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION, who introduced Dr. Robert W. Snoke. Dr. Snoke brought greetings from the American Hospital Association; and John J. Zugich, president of the American Society of Hospital Pharmacists, welcomed Institute participants on behalf of the Society.

As an introduction to hospital administration and planning, Dr. J. R. McGibony, assistant chief of the Hospital Facilities Division, U. S. Public Health Service, spoke on "Expansion of Hospital Facilities." He briefly outlined the provisions and present status of the Hospital Survey and Construction Act, and pointed out the part which hospital pharmacists may take in attaining the objective of better patient care in the nation's hospitals.

To further orient the Institute members on administrative problems in the hospital pharmacy, Dr. Snoke and Mr. Zugich reviewed the general functions and policies of the pharmacy department. A question and answer period concerning administrative problems followed.

Continuing the lectures on administrative problems on Tuesday morning Don E. Francke, chief pharmacist at University Hospital in Ann Arbor, Mich., presented a discussion on "The Therapeutics Committee and the Hospital Formulary." Mr. Francke outlined the procedure for initiating a therapeutics committee in the hospital, with the pharmacist serving as secretary. Discussing the steps in the preparation of a hospital formulary, he displayed formularies which are now in use to depict typical page format and style.

Speaking on the teaching responsibilities of a hospital pharmacist, Herbert L. Flack presented a discussion of methods of in-

structing student nurses, graduate nurses and the medical staff. Illustrative material was distributed including samples of publications by hospital pharmacists for presenting current information to their medical staffs.

Illustrated lectures on "Planning the Hospital Pharmacy to Meet Modern Needs" and "Techniques for Promoting Efficiency in the Hospital Pharmacy" were presented by Harvey A. K. Whitney, formerly chief pharmacist at University Hospital in Ann Arbor, Mich.

Highlighting the Tuesday meeting was a lecture on the role of the pharmacist in hospital narcotic control by A. L. Tennyson, chief of the Narcotic Section of the General Counsel's Office of the Bureau of Narcotics.

Included also in the series on hospital administration were lectures on pharmacy reports and records by Albert P. Lauve of New Orleans, and on purchasing by John Zugich of New Haven.

Manufacturing

Highlighting the lectures on manufacturing in the hospital pharmacy was the discussion on the economics of manufacturing in a 100-bed institution by J. Robert Cathcart, chief pharmacist at Chester County (Pa.) Hospital. He presented examples of pharmaceutical preparations that can be prepared economically in the hospital pharmacy, giving figures to show the saving which can be made for the hospital and for its patients.

A lecture on preparation of allergenic extracts was presented by Don Francke along with a demonstration of preparing extracts, both for diagnosis and therapeutic treatment of allergies. Dr. W. Arthur Purdum, Johns Hopkins University Hospital Pharmacy, gave a lecture-demonstration on the manufacturing of ointments, emulsions and suspensions. A lecture on ophthalmic medications, along with specific formulas and directions for preparations, was also given by Dr. Purdum. Concluding the discussions on manufacturing procedure was a lecture concerning the manufacture of tablets in the hospital pharmacy by Albert Lauve.

Devoting more than a day to lectures and discussions on the preparation of parenteral medications, the Institute was fortunate to have Dr. Carl W. Walter, director, Laboratory for Surgical Research and Associate in Surgery at Harvard Medical School. Dr. Walter discussed the manufacture of parenteral solutions including such aspects as pyrogens, distilled water, sterilization techniques, bacterial filtration, aseptic techniques, and procedure for typical preparations.

Continuing the lectures on parenteral solution manufacture, Mrs. Martha Coffield of St. Joseph's Infirmary, Atlanta, Ga., presented a lecture on planning and equipping a sterile solutions room or laboratory. Additional discussions on the manufacture and packaging of parenteral fluids were presented by J. Robert Cathcart and Albert Lauve.

Since hospital pharmacy has come to play an important part in providing medical care in government agencies, the Institute featured the following officials in lectures on the future development of hospital pharmacy in government service: E. Burns Geiger, chief of the Pharmacy Division of the Veterans Administration; George Archambault, chief of the Pharmacy Section, Hospital Division of the U. S. Public Health Service; Colonel Othmar F. Goriup, chief, Medical Service Corps of the Department of the Army, and Commander W. Paul Briggs, Medical Service Corps of the Department of the Navy.

Each of these men emphasized that there is an opportunity for pharmacists meeting high standards in any one of the branches of government service.

Certificates Awarded

Concluding the concentrated course in hospital pharmacy, Dr. Austin Smith of the Council on Pharmacy and Chemistry of the American Medical Association presented a discussion on new medications.

The final event was a dinner meeting Friday night, with John Zugich presiding. Members of the Institute on Hospital Pharmacy who had attended all sessions were awarded a certificate by the American Hospital Association.

science news capsules

TRANSFUSION of blood under pressure into an artery has reportedly saved more than a hundred patients from bleeding to death. Dr. Irvine H. Page of the Cleveland Clinic Foundation, in describing the operation, stated that patients who have stopped breathing will take a deep breath instantly when the blood starts flowing into their arteries under pressure, and frequently the heart starts beating again. Dogs that had stopped breathing for as long as eight minutes have been revived by the treatment.

UNIDENTIFIED ingredient in fingernail polish "base" apparently causes damage to some women's nails. Dr. James H. Mitchell and associates of the University of Illinois College of Medicine and Presbyterian Hospital reported that evidence of several hundred cases have been received from physicians all over the United States. The "base coat," which improves adherence of the polish, has in these cases turned the nails purplish blue, then white, and later the nails break away from the fingers.

RHEUMATIC FEVER incidence may be reduced by preventive doses of penicillin which would suppress or kill streptococci before they have gained a foothold in the throats of children. Dr. Benedict F. Massel and associates of Boston, reporting their clinical experience at the meeting of the American Medical Association, recommended further trial of preventive doses of penicillin for children in communities, schools or families where there is an outbreak of "strep throats."

SCREENING of thousands of chemical compounds —made by industrial, government and university laboratories—is being carried out by the Chemical-Biological Coordination Center in Washington, D. C. The drugs are cataloged by the CBCC for their biological activity, and those showing promise are sent to collaborating university and government laboratories for testing as possible remedies for cancer and other diseases.

IDENTIFICATION of a dime-sized area in the middle of the brain as the seat of consciousness was announced by Drs. George N. Thompson and J. M. Nielsen of the University of Southern California at the American Medical Association meeting. Destruction of this part of the brain causes the patient to lose consciousness and ultimately die. It is believed, however, that victims of encephalitis probably suffer damage to but not destruction of this spot in their brains.

VITAMIN K test for early detection of cirrhosis of the liver was recommended by Drs. Shepard Shapiro and Murry Weiner of New York and Dr. Paul Unger of Miami Beach, Fla., at the American Medical Association meeting. In their test, vitamin K is injected intravenously. If the liver is healthy, the vitamin is used normally and completely as shown by its production of prothrombin. A diseased liver, however, utilizes the vitamin only partially and with considerable delay.

CHEMICALS TAGGED with radioactive elements are now being sold to researchers through the Atomic Energy Commission. These chemicals are compounds such as certain acids and alcohols in which one of the elements is radioactive. Only radioactive isotopes of some chemical elements had previously been available.

THE ZATOR METHOD of indexing information has been applied to the recording and finding of information about chemicals and their properties. In this procedure complicated chemical names are abandoned in indexing, and simple codes representing essential parts of the structural formulas are substituted. Up to a dozen items of information can be placed on a simple notched card. Compounds with desired combinations of chemical or other properties can be picked out of the file quickly by use of a mechanical sorting box. The device was developed by Calvin N. Mooers of the Zator Co., Cambridge, Mass.

BONE BANKS may become as common as blood banks if recommendations of Dr. J. R. Cobb of New York are followed. Reporting in the *Journal of the American Medical Association* (137: 592, 1948), Dr. Cobb cites need for community bone banks to supply surgeons with bone grafts of every size and description. The bones would be preserved in deep freeze cabinets.

PHENURONE, a synthetic compound made from phenobarbital, is apparently effective in treatment of epilepsy, according to an announcement made by Dr. M. A. Spielman of Abbott Research Laboratories at the A.C.S. medicinal chemistry symposium. The new drug appears to be equally promising in all

three common types of epilepsy. Dr. Frederick Gibbs of the University of Illinois College of Medicine conducted clinical trials.

TRANSISTOR is the name of a new device—slimmer than a pencil and less than an inch long—that may replace radio vacuum tubes. Heart of the transitor is a bit of specially treated germanium metal, which amplifies or oscillates current without the complexity of plates and wires in an airless tube. It should permit more stable and durable radios, television sets and electronic devices. Originators of the transistor at the Bell Telephone Laboratories consider it the first serious rival to the vacuum tube in forty years.

HEPARIN AND DICUMAROL are recommended for treatment of all cases of coronary thrombosis with myocardial infarction, unless there is a definite reason against it, such as a tendency to hemorrhage. This conclusion was reached by a committee of the American Heart Association, headed by Dr. Irving S. Wright of New York, after a review of evidence in 800 cases.

HIGH BLOOD PRESSURE is reported to have been relieved by injection of dihydroergocornine. At the Inter-American Cardiological Congress, Drs. Ralph M. Tandowsky and Fred V. Cerini of Los Angeles reported preliminary trials of the drug, the action of which is based on functional blockage of sympathetic nerve impulses.

WHALES are in danger of traveling the unreturning road to extinction, according to Britisher J. E. Hamilton, a veteran student of the ways of the great sea-beasts.

CEPHARANTHINE, a Japanese derivative of quinine, is undergoing trial as a possible remedy for tuberculosis. Dr. Alfred Burger of the University of Virginia announced at the A.C.S. Medicinal Chemical Symposium that the studies are just getting under way and no conclusions concerning the drug's effectiveness can be drawn as yet.

X-RAYS relieve pain, and in some cases stiffness of the back, in rheumatoid arthritis of the spine. Results of the treatment were reported by Dr. William D. Robinson of the University of Michigan at the annual meeting of the American Rheumatism Association. According to Dr. Robinson, it is not known whether or not the disease is arrested by X-ray treatments, but in a number of patients treated five to eight years ago, the disease has not advanced.

EXCESS FAT in heart muscle may cause sudden death. Evidence obtained from more than 5000 autopsies, reported to the Inter-American Cardiological Congress by Drs. William A. Brams and Kurt Biss of Michael Reese Hospital, Chicago, showed that six of every 100 hearts examined were fatty. Fatty hearts were found in most of those who had had diabetes, gall bladder disease or disease of the liver or pancreas. The physicians believe cases of sudden death may have been due to fat interfering with the heart's ability to contract.

PARPANIT produced more improvement than other drugs in half of 24 patients suffering from Parkinson's disease. This trial of the new drug was reported at the American Neurological Association meeting by Drs. Robert S. Schwab and associates of Boston. They state that parpanit acts like belladonna in reducing the rigidity of the disease but without belladonna's unpleasant effects.

PREPAREDNESS PLANS in the event of a national medical emergency may include wholesale training of American women to help physicians and nurses, according to Dr. R. L. Sensenich of South Bend, Ind., president of the American Medical Association. Teachers and others with some experience in psychology or personnel management may be drafted to aid with psychiatric problems expected to arise in bombed areas in case of an atomic attack.

"STILL" PICTURES of an artillery shell traveling at a speed of over 1800 miles an hour can be taken with special equipment announced by General Electric. The flash, which lasts only two-millionths of a second, is set off by the moving projectile as it cuts a beam of light from an electric eye or photocell. The resulting photograph shows virtually no motion, but the shell actually moved forward 65 thousandths of an inch during the two-microsecond exposure.

TELEPHONE X-RAY service was announced at the meeting of the American Medical Association by Dr. J. Gershon-Cohen of Philadelphia and A. G. Cooley, New York engineer. The service is now operating routinely between Chester Co. (Pa.) Hospital and Dr. Gershon-Cohen's office fifty miles away. The technique is similar to that used in transmitting newspaper pictures and can be operated between any two points on the continent.

SEROTONIN, the blood chemical twice as powerful as adrenalin, has been isolated in crystalline form by Drs. Irvine H. Page, Maurice Rapport and Arda Green of the Cleveland Clinic Foundation. Although serotonin's existence in the blood has been known for years, it is present in only minute quantities. Studies are now under way to learn its chemical structure.

TABLETS administered to young children should first be crushed and moistened with water. This warning by Dr. C. L. Heald of Sigourney, Ia., is prompted by the death of a child due to half a sulfonamide tablet becoming lodged in the larynx. When tablets are prescribed, he states, parents should be instructed on how to give them safely, or the physician should prescribe liquid preparations.

INFORMATION SERVICE

Members of the American Pharmaceutical Association are invited to submit their professional problems to the Journal, 2215 Constitution Ave., N.W., Washington 7, D. C., giving all pertinent details. Advisory service is provided by the A. Ph. A. library and technical staff and the Journal panel of technical consultants.

DISAGREEABLE ODOR

What would cause the following prescription for capsules to acquire a disagreeable odor after standing for two weeks?

Purodigin	*mg. 0.05*
Theobrom. sod. sal.	*gr. v*
Phenobarbital	*gr. 3/8*
Nicotinamide	*mg. 150.0*
Ac. acetylsal.	*gr. viiss*
Camphor monobromat.	*gr. iss*

—J. B., Ohio

The difficulty with this prescription is probably due to a reaction between acetylsalicylic acid and camphor monobromate in the presence of a small amount of moisture. This moisture may be contained in the acetylsalicylic acid. It would cause the acetylsalicylic acid to break down to acetic and salicylic acid, which would give a strong acetic odor; also, the camphor monobromate may break down, giving off a bromine-like odor. It would seem wise to recommend two prescriptions, dispensing the $7\frac{1}{2}$ gr. of acetylsalicylic acid in one capsule and the balance of the ingredients in another capsule.

SUPERPHOSPHATE

What is superphosphate and where may I obtain it?—A. N., New York

Superphosphate is a mixture of monobasic calcium phosphate with calcium sulfate. It contains 28 to 30% soluble phosphate as P_2O_5 and is used as a fertilizer. Several manufacturers who supply superphosphate are: The American Agricultural Chemical Co., 50 Church St., N. Y.; The Davidson Chemical Corp., 20 Hopkins Place, Baltimore, Md.; and The Monsanto Chemical Co., Merrimac Chemical Div., Boston, Mass.

DILUENT FOR EXTRACTS

Why does U. S. P. XIII state that magnesium carbonate and magnesium oxide should not be used in powdered extracts of belladonna and stramonium?—D. M., Ohio

The alkaloids of these drugs are esters, which would be much more readily hydrolyzed in the presence of moisture if magnesium oxide or carbonate were used than they would be if some neutral diluent, such as starch, were used.

ETHYL-NOR-EPINEPHRINE

A doctor requests information regarding Ethyl-nor-epinephrine, a nasal constrictor said not to affect those with high blood pressure. Could you pass on any information as to the manufacturer?—E. D., New Jersey

Ethyl-nor-epinephrine is made by the Winthrop Chemical Co., 170 Varick St., New York 13, N. Y., and marketed under the trade name of "Butanefrin."

As appearing in current Medical Journals

The Role of IODINE
in Clinical Diagnosis

• Diagnosis is the art or scientific process by which a disease is recognized. Success or failure in establishing a correct diagnosis depends in large measure on the use of reliable, safe and efficient clinical and laboratory procedures.

• Iodine compounds occupy a unique position as indispensable aids in providing X-ray evidence that is informative and most frequently complete. They supply the ideal contrast media for many diagnostic procedures — including bronchography, cholecystography, pyelography and myelography. Without these compounds, an accurate diagnosis might be difficult or impossible to make.

• Likewise in the fields of prevention and therapy, few medicaments serve such useful and varied purposes as Iodine with its many compounds and derivatives.

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RADIOACTIVE IODINE

One of our physicians is interested in obtaining radioactive iodine for clinical use. Do you know where it may be obtained?—H. I., Georgia

The distribution of all radioactive chemicals is controlled by the Atomic Energy Commission, Washington 25, D. C. It is our understanding that radioactive iodine has been released for experimental clinical trial to only a limited number of specialists. The conditions under which this material is released are so stringent that it is doubtful that you could obtain it for your physician's use.

ODORLESS GARLIC

I have been referred to you by the U. S. Foreign Service at Brussels. We should like to obtain a concentrated, odorless allium extract, which we understand is made in the United States.—V. G., Belgium

You undoubtedly refer to tablets containing the principles of garlic, in which the absorptive power of vegetable charcoal is used to render the garlic odorless and tasteless. This product is available as Allisatin tablets from the Sandoz Chemical Works, 68 Charlton St., New York 14. Tablets containing dehydrated garlic are also available as Allimin through the Van Patten Pharmaceutical Co., 500 N. Dearborn St., Chicago 10.

MOTION SICKNESS

Please supply us with a formula for use in preventing motion sickness.—F. S., Connecticut.

The following formula was published in the *Journal of the American Medical Association*, 131: 971, 1946:

Sodium amytal	60.0 mg.
Scopolamine-hydrobromide	0.2 mg.
Atropine sulfate	0.15 mg.

A public service patent has recently been issued to L. L. Barrow of the U. S. Army for the above formula. He has also obtained a patent for a second formula which contains

the above ingredients and 1/15 gr. of amphetamine sulfate.

For a review on motion sickness and preventive therapy, see THIS JOURNAL, 7:109, 1946.

OPHTHALMIC OINTMENT

Please give me a formula for sulfathiazole ophthalmic ointment.—J. V., Guatemala

The University of Michigan Hospital Formulary gives the following formula for sulfathiazole ophthalmic ointment:

Sulfathiazole	0.5 Gm.
Wool fat	2.5 Gm.
Liquid petrolatum	0.5 Gm.
White petrolatum, to make	10.0 Gm.

NEED FOR VINYL RESIN

What type of resin should we use in the following prescription that the acetone will dissolve?

Vinyl resin	*75 cc.*
Acetone	*300 cc.*
Flexible collodion	*75 cc.*

—W. K., Idaho

We find that vinyl acetate resin has been used in dermatological preparations comparable to this prescription. The resin is readily soluble in most organic solvents, including acetone, alcohol and ether. Vinyl acetate resin may be obtained from the Carbide and Carbon Chemicals Corp., 30 E. 42nd St., New York 17.

HOFFMAN'S BALSAM

Where may we obtain Hoffman's Lung Balsam?—J. C., Missouri

We assume that you refer to Hoffmann's Balsam from *Pharmaceutical Recipe Book III*. The formula is as follows:

Oil of lavender	4 cc.
Eugenol	4 cc.
Oil of cinnamon	4 cc.
Oil of thyme	4 cc.
Oil of lemon	4 cc.
Oil of myristica	4 cc.
Peruvian balsam	16 cc.
Alcohol, a sufficient quantity,	
To make	1000 cc.

Dissolve the oils, eugenol and peruvian balsam in 900 cc. of alcohol. Filter and add sufficient alcohol, through the filter, to make 1000 cc.

LADD'S PASTE

Please tell us where we can obtain Ladd's paste used in the care of colostomy patients.—W. K., Idaho

We understand that Ladd's paste was developed by Dr. W. E. Ladd of the Children's Hospital in Boston. The formula for this preparation, as reported to us from an institution in this area, follows:

Aluminum powder	50
Liquid petrolatum	30
Zinc ointment	70

AN INCOMPATIBILITY

Why do salicylic acid and Tincture of Merthiolate not stay in solution? After the solution stands for about three weeks, a precipitate forms.—S. G.Indiana

It is assumed that salicylic acid and Tincture of Merthiolate are incompatible because Merthiolate, a sodium salt, is degradated into other products, which precipitate out on standing.

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43rd St., Woodland and Kingsessing Aves., Philadelphia 4, Pa. Founded in 1821.
Undergraduate courses in Pharmacy, Chemistry, Bacteriology or Biology lead to B.Sc. degrees and interesting and successful careers. Graduate studies in Pharm., Bact. or Biol. also available. Applications for future enrollment now considered. Coeducational. Write for catalog.

PROTECTIVE CREAM

Do you have a procedure for making a good protective cream?—R. A., Colorado

The formula below has been suggested by the Massachusetts College of Pharmacy:

Stearic acid	10	Gm.
White wax	2	Gm.
White petrolatum	4.5	Gm.
Triethanolamine	1.5	Gm.
Glycerin	8	Gm.
Distilled water	54	Gm.
Talc	20	Gm.
Perfume as desired		

Melt the white wax, the stearic acid and the white petrolatum on a water bath and heat to 85° C. Mix the triethanolamine, the glycerin and the water and heat to 85° C. Add the aqueous solution to the oily mixture, remove from the source of heat, and stir until congealed. Incorporate the talc with the congealed base by levigation or milling. Perfume as desired.

NEUTRACOLOR IDENTIFIED

What is Neutracolor?—E. J., Massachusetts

Neutracolor is a brand of bentonite containing iron oxide manufactured by Almay, Inc., New York, and distributed by Schieffelin & Co., New York.

EPARUTEN TABLETS

I have a prescription from Venezuela calling for Eparuten tablets. Please advise where I can obtain them.—E. T., Florida

A thorough search has yielded no information concerning this product. However, diphenylhydantoin sodium U. S. P. (dilantin sodium) is distributed in South America under the British proprietary name Epanutin (Boots, Inc.). You may want to investigate the possibility that this drug was intended, particularly if the Venezuelan prescription is in handwriting.

WHAT IS CETYLCIDE?

Please send me information on Cetylcide.—F. S., Mass.

Cetylcide is a disinfectant made by the Curvlite Products Co., Port Chester, N. Y. Chemically it is cetyl dimethyl ethyl ammonium bromide.

FROM THE SECRETARY'S MAY DIARY

1st All day at the National Health Assembly in the air-conditioned Statler Hotel where health officers and health-minded laymen, as well as representatives of all the professions dealing with medical care programs and problems, were gathered from all over the U. S. to the extent of 800 or more. The work of the Assembly was done chiefly in 14 sections, and pharmacy was well represented in the sections on personnel, research, hospitals and medical care. In the evening, to a cocktail party in honor of President Truman who later spoke at the great banquet of the Health Assembly. His extemporaneous remarks were most informal, reiterating his stand for a national health program for all the people.

2nd Continuation of the National Health Assembly and spending time with Drs. DuMez, Powers, Stephen Wilson and others during the discussions involving pharmacists. Much merriment in the taxi which took us from A. PH. A. headquarters to the Statler when the driver conducted a quiz and learned that both DuMez and Powers knew the name of the Lone Ranger's horse.

3rd Again the National Health Assembly, now at the halfway mark, with many of the skeptics conceding that the discussions are most helpful and worth while and that worth-while conclusions will probably be reached. Now incorporating into the record a statement on pharmacy personnel and a plea for funds to carry on graduate instruction to swell the ranks of competent teachers for pharmacy colleges. At night the great audience listened to addresses on world health problems by Fishbein, Laugier, Soper and others. Late at night approving final proofs of war memorial dedication program.

4th Now listening to a remarkable summary of the National Health Asssembly discussions and conclusions by radio commentator Quincy Howe, and no one could find fault with this impartial presentation of the facts. At noon to sit at the head table, with other representatives of the health professions, at the concluding luncheon of the National Health Assembly which was dedicated to the U. S. Public Health Service on its 150th anniversary. Here Dr. C.-E. A. Winslow, dean of public health teachers, presided as toastmaster and Surgeon Gen-

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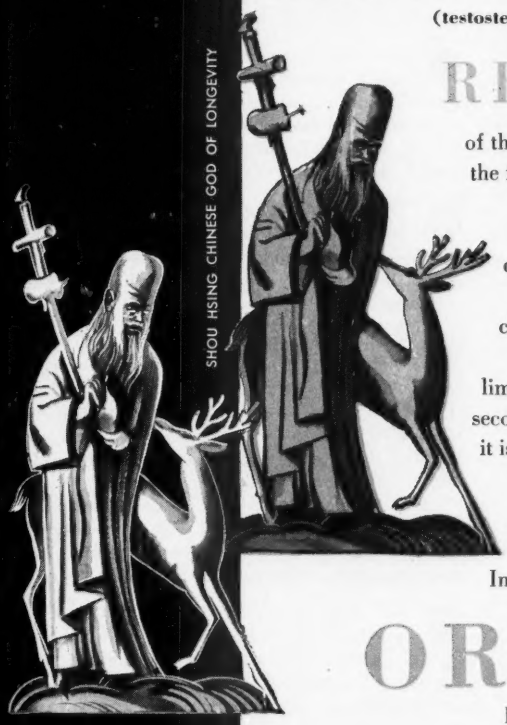
(testosterone propionate)



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of the natural testicular hormone in the form of the propionic acid ester of the true primary male sex hormone. ORETON* duplicates the activity of the naturally circulating male hormone in clinical effect. Where once it was believed that this action was limited to reproductive organs and secondary sex characteristics, now it is apparent that ORETON has far-reaching metabolic effects, identical with those of testosterone in the male.

In the androgen-deficient patient,

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has been shown to be capable of

- ***promoting weight-gain***[1]
- ***raising the metabolic rate***[2]
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- ***increasing energy and vigor***[3]

Such properties are valuable not only in promoting fullest correction of hypogonadal states but also in checking certain metabolic deteriorations in the aged.

PACKAGING: Ampuls of 1 cc., each cc. containing 5, 10 or 25 mg.; boxes of 3, 6 and 50 ampuls. Also multiple dose vials of 10 cc., each cc. containing 25 or 50 mg.; boxes of 1 vial.

Bibliography: (1) McCullagh, E. P., and McGurl, F. J.: Endocrinology **26**:377, 1940. (2) Thompson, W. O., and Heckel, N. J.: J.A.M.A. **113**:2124, 1939. (3) Goldzieher, M. A.: Geriatrics **1**:226, 1946.

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eral Scheele gave the principal talk. Also attending a meeting of the Executive Committee of the National Health Assembly, which found much to compliment Federal Security Administrator Oscar Ewing and his able staff about.

5th Now putting the finishing touches on the war memorial dedication preparations and hoping and praying for fair weather for the outdoor ceremony on Friday, with little encouragement from the Weather Bureau. These are occasions which bring unsolicited testimony of staff loyalty and show up deficiencies where such exist.

6th A large group, highly representative of all phases of pharmacy, gathered in the lecture room of our neighboring institution—the National Academy of Sciences—to listen to as fine a group of speakers representing official and priyate organizations dealing with national security that American pharmacy has ever assembled for a single occasion. The buffet luncheon at A. PH. A. headquarters was most enjoyable. In the evening the pharmacy faculty representatives and the state association secretaries gathered separately at the Ambassador and Hay-Adams Hotels to discuss some problems of their own.

7th A great day in A. PH. A. history, albeit the weatherman was most unkind and kept us from an outdoor ceremony and a permanent record in colored cinema. But he did not dampen the spirit of the occasion one iota. Dr. Dunning's gift—a memorial to all pharmacists who served in the wars of our country—provided the occasion for a genuine rededication of the A. PH. A.'s services to the profession and to the nation. The luncheon at the Mayflower Hotel was a fitting climax to two memorable days in the history of A. PH. A. Late in the afternoon conferring with President Dretzka and San Francisco Convention Chairman Troy Daniels on the program and details for our rapidly approaching annual meeting. Then to dinner with Jim Hill of Niagara Falls who has ideas about the future of all organizations working for greater emphasis on pharmacy's prime objective.

8th Early to the office to confer with Dean O'Day of the University of Wyoming whose A. PH. A. Student Branch is the latest addition to our growing student organization. Now conferring with Beal, Dretzka and Daniels on convention details. Later an automobile ride to Frederick, Md., and returning in time to hear an Arlington, Va., radio station rebroadcasting some of the dedication ceremony of the previous day.

9th With President Dretzka and Council Chairman Beal by auto to Fredericksburg, Va., to inspect the Hugh Mercer Apothecary Shop, the George Washington Farm, where the "father of our country" spent some of his youth, and after dinner returning to Washington ready for the big Monday grind.

10th Some time spent this day at the International Congress of Tropical Medicine and Malaria, viewing the exhibits and meeting distinguished South American scientists of whom a number visited headquarters to discuss pharmaceutical problems.

11th After a busy morning at the office enjoyed the annual veterans luncheon at Olney, Md., with the D. C. and Baltimore members joining in the spirit of fun and good fellowship. These organizations of veteran pharmacists have carried a fine social spirit into all branches of the calling.

13th This day and yesterday developing programs and plans for the San Francisco convention. Also looking in on the Rutin Conference called here by Dr. Powers to develop N. F. standards for this important drug.

14th Today welcoming Dr. and Mrs. Heber W. Youngken who were chaperoning a large group of students from the Massachusetts College of Pharmacy, ably assisted by Professors Stoklosa and Mathis. All of the senior staff addressed this attentive group on the work of their departments before the students visited the various parts of the building. Senior Pharmacist George Archambault, of U. S. Public Health Service, a Massachusetts product, was also on hand to welcome the boys and girls from the home town.

16th Now working with the Committee on Standards for Hospital Pharmacies which gathered here under the auspices of the Division of Hospital Pharmacy for a two-day session and promises much for the future.

18th Much routine activity preparing for the A.M.A. display and various convention chores, including preparation of advance convention publicity, Kilmer Prize, Ebert Prize and other special award details.

19th The day's toil pleasantly interrupted at luncheon where Mrs. Coghill, an erstwhile hospital pharmacist, was a staff guest, with Dr. Powers and Miss Niemeyer joining in doing the honors.

22nd To Fredericksburg, Va., with Harold Darnell and Richard Deno for the annual meeting of the Friends of Historical Pharmacy. Met by Glenn Sonnedecker, secretary of the organization which maintains the Hugh Mercer Apothecary Shop. An interesting meeting in this historic shrine with much planning for the future, and then a speedy return to Washington to make the train for Cleveland.

23rd Meeting Dr. E. C. Elliott at the Statler Hotel in Cleveland and then to the Western Reserve University to confer with President Leuttner and his trustees on the future of the College of Pharmacy. A luncheon conference with Dean Wyss and then on the afternoon train with Dr. Elliott to Toledo, spending the night at the Commodore Peary Hotel.

24th All day at the University of Toledo inspecting the College of Pharmacy with Dr. Elliott and conferring with President White, Dean Larwood, Professors Hogstad and Baker and others. A pleasant visit with Sister Mary John whose parenteral solution set-up is the envy of many a hospital pharmacist. Also receiving a postgraduate education in prescription practice at the Bundt and the Rupp and Bowman establishments, which have helped to make pharmacy famous in Toledo. A pleasant dinner with Mr. Rudy of the Owen-Illinois Glass Company as host at the Commodore Peary before embarking for the return to Washington.

26th Early to the Pentagon for a meeting of the Advisory Committee to Dr. Perrin Long who is on leave of absence from Johns Hopkins to organize the medical phases of civil defense planning. A busy day with a highly alert and serious group planning serious things in which pharmacists will have an important part should the dreaded emergency of future wars materialize. Also brief conferences with Deputy Surgeon General Armstrong and General Hays and Colonel Gruber of the Medical Supply Division of the Surgeon General's Office.

27th Now working on the Toledo and Cleveland reports to be submitted to the American Council on Pharmaceutical Education. Also conferring by long distance with Troy Daniels and the San Francisco convention committee on the program.

28th Conferring with interested groups in the Senate and House on the proposed removal of controls on quinidine. Interviewing applicants for laboratory and office positions. At night to the meeting of the D. C. Branch of the A. PH. A. where Dr. Purdum was one of the speakers.

29th Early to the office and then to Red Bank for the week end which included a trip to the Far Hills Inn at Somerville, N. J., where several hundred pharmacists gathered to honor Adolph V. Palumbo, just completing a ten-year term on the New Jersey Board of Pharmacy. Glad to pay tribute to the splendid service of this fine professional pharmacist who holds the respect of the people of his community and has been honored by them as well as by the pharmacists of New Jersey in many ways.

31st Most of this morning spent in Trenton, N. J., and then to New York for the annual meeting of the Joint Committee of the A. PH. A. and American Social Hygiene Association at the Harvard Club. Here Dr. Walter Clarke, director of the A. S. H. A., was host at luncheon and Emil Horn of Milwaukee attended his first meeting of the Committee. Returned to Washington with Dr. A. G. DuMez whose A. PH. A. presidential activity was responsible for the organization of this Committee.

ASSOCIATIONS

Norman Hammelmann of Veterans Hospital at Jefferson Barracks becomes president of the **Hospital Pharmacists Association of Greater St. Louis.** He succeeds William Woodall of the Missouri Pacific Hospital.

E. W. O'Hanlon, founder and president of the O'Hanlon-Watson Drug Co. of Winston-Salem, N. C., receives the first mortar and pestle award from the **North Carolina Pharmaceutical Association** for "eminent contributions as a... pharmacist." Mr. O'Hanlon has served as a practicing pharmacist for more than fifty years.

The **Brooklyn College of Pharmacy Alumni Association** was guest of New York's A. Ph. A. Branch this spring for a program on "Pharmacy's New Look" (in the armed forces), featuring Comdr. W. Paul Briggs representing the Navy Bureau of Medicine and Surgery, and Col. O. F. Goriup, chief of the Army's Medical Service Corps.

PHARMACEUTICAL MANUFACTURERS

Several sections of the **Parke, Davis** Research Laboratories were recently photographed for television reproduction. Audiences will see scenes of pharmacy college students touring the plant; research in radioactivity laboratories, chemical control work and other phases of modern drug manufacture.

The **Squibb Award** for 1948, administered by the Association for the Study of Internal Secretions, goes to Dr. Fuller Albright, associate professor of medicine at Harvard Medical School. The Squibb Award has been given annually for eight years for distinguished research contributing to the advancement of knowledge in the field of endocrinology.

COLLEGES

Philadelphia College of Pharmacy and Science has awarded the degree of Doctor of Science, Honoris Causa, to Dr. James F. Couch, senior

SOPRONOL POWDER FOR PROPHYLAXIS

Sopronol Improved offers the doctor a *physiologic* attack on fungi—which is one reason for the increasing number of Sopronol prescriptions. It is based on a combination of propionates and caprylates, as found in human sweat. Sopronol augments Nature's own defense against invasive organisms.

Sopronol therapy is fatty acid therapy—now accepted as the modern treatment for dermatophytosis, such as Athlete's Foot. It is showing an outstanding record of results.

Sopronol is mild, safe. It is virtually non-irritating, non-sensitizing, non-keratolytic.

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Propionic acid	2.7%
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1 oz. tubes

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chemist at the U. S. Department of Agriculture's Eastern Regional Research Laboratory, in recognition of his "life-long service to the cause of science and for the good of mankind." Dr. Couch has been active in chemical research for the department for 31 years, and recently received a Distinguished Service Award from the Secretary for research which led to commercial production of rutin.

Dr. Frank T. Maher will assume duties as professor of pharmacognosy and pharmacology and head of that department at the **University of Illinois College of Pharmacy** on Sept. 1. Dr. Maher has been a member of the faculty at the university since 1937.

AT RANDOM

State Representative **William Beardsley,** pharmacist, won the Republican nomination for governor of Iowa over the incumbent, Gov. Robert Blue. Gov. Blue conceded defeat before half the returns were reported.

Television becomes a teaching medium in the field of medicine, with the first major demonstration under the auspices of Northwestern University. Assistance in the project was given by E. R. Squibb & Sons, RCA Victor and Passavant Memorial Hospital of Chicago. For the five days of the American Medical Association's annual convention, 12,000 physicians and surgeons had an opportunity to see surgery and clinical demonstrations televised.

A clean-up campaign on **home medicine chests** was stimulated in New York City this summer by the home safety director of the city's Safety Council. New Yorkers were urged to get rid of left-over medicines, check first-aid supplies, and tape or tie covers over poison containers as a safeguard against accidental poisoning.

AMIDONE FOR REST PAINS

Administered orally in 5- to 15-mg. doses, Amidone satisfactorily controlled rest pain from ischemia paresthesias and "night cramps" of certain arterial diseases, according to Dr. Roy P. Popkin of the Cedars of Lebanon Hospital, Los Angeles. Although the action of Amidone appeared to resemble morphine, none of the patients developed addiction or increased tolerance to the drug. (Others have pointed out potential properties of addiction, however.) The drug was well tolerated when administered to bed patients, but standing or walking following administration often brought on lightheadedness, nausea or vomiting sufficiently severe to warrant withdrawal of the drug.

—Am. Heart J., 35: 793, 1948

A. Ph. A. Branches

LOCAL BRANCHES

AT THE May meeting of the **Philadelphia Branch** Dr. George McCoy of the Pennsylvania Salt Co. discussed insecticides. Officers elected for the year are: John E. Kramer, president; Robert L. McNeil, Jr., 1st vice-president; Paul W. Wilcox, 2nd vice-president; Harold A. Clymer, secretary-treasurer; Madeline O. Holland, delegate to the House of Delegates; and Paul W. Wilcox, alternate delegate.

The fourth annual banquet was held by the **Northwestern Ohio Branch** on June 3. Dick Huepenbecker was chairman of the banquet committee and Carlton Siegel acted as master of ceremonies.

The May meeting of the **City of Washington Branch** included addresses by Walter F. McRae, acting chief, Interstate Division of the Food and Drug Administration, and W. Arthur Purdum, chief pharmacist of the Johns Hopkins Hospital and president-elect of the American Society of Hospital Pharmacists. Mr. McRae spoke on "Parenteral Medications and the Food and Drug Administration." The title of Dr. Purdum's address was "New Penicillin Products."

As customary the May meeting of the **Michigan Branch** was held in conjunction with the annual Pharmaceutical Conference, which was the fourteenth sponsored by the University of Michigan College of Pharmacy. Pharmacists attending heard discussions of commercial and legal aspects of everyday pharmacy operation, clinical and pharmacologic effects of quaternary ammonium compounds, and the small business and private enterprise economy. There was also a discussion following a motion picture titled, "Energy Release from Food." A ladies' tea was held in the afternoon, and a dinner meeting followed the afternoon conference.

STUDENT BRANCHES

AT THE April session members of **Fordham University Branch** heard Dr. Robert P. Fischelis, secretary and general manager of the AMERICAN PHARMACEUTICAL ASSOCIATION, speak on the activities of the parent organization and opportunities for graduates in the field of pharmacy.

A banquet was held in May by the **University of Buffalo Branch,** Secretary Marcelyn Burke reports.

Drake University Branch sponsored several special activities during National Pharmacy Week. A float based on the Pharmacy Week theme, "Your Pharmacist Works for Better Community Health," was entered in the annual Drake Relays parade; and two special evening meetings were held featuring speakers and films. A banquet and dance closed the year's social season and guest speaker for the occasion was Joe Moore, head of the Iowa Humane Society, who spoke on juvenile delinquency. Officers were elected for the ensuing year as follows: Jim Christ, president; Robert Carey, vice-president; William Holcom, secretary; and Faber Hood, treasurer.

President Jacob Smithe of the **Ferris Institute Branch** and branch members Helen Smith and Harold V. Bunte attended the Indiana Pharmaceutical Association convention, according to Harriet Murray, corresponding secretary.

A round-up report from the **University of Nebraska Branch** lists the year's activities. President Sylvester H. Dretzka of the A. PH. A. addressed the group on "Progress Through Organization" at one of the sessions. Films provided by Abbott Laboratories and the National Cash Register Co. were featured, and two picnics and the annual banquet were sponsored by the Branch. Officers of the Branch are: Richard McMahon, president; Walter Johnson, vice-president; Dorothyann Miller, secretary; and Warren Barth, treasurer.

Officers of the **University of Utah Branch** were installed at a recent dinner dance. They are: Joseph D. Halgren, president; Leland M. Padfield, vice-president; Ann Marie Outzen, secretary; D. Wallace Thorup, business manager; Ray Spencer and Robert P. Ovard, editor and associate editor, respectively; Lawrence Pryor, sophomore representative; and Douglas Smith, junior representative. Faculty sponsors chosen by the group are: Dr. E. A. Swinyard, treasurer; Dr. Jack Orr, editor; and Dr. L. David Hiner, faculty adviser.

State College of Washington Branch has elected the following officers: Wayne Doane, president; Wilfred E. Bottemiller, vice-president; Lorna Lichter, reporter; and Haakon Bang, secretary.

Secretary Barbara Grubb of the **Oregon State College Branch** reports a well-attended picnic held for all pharmacy students, families and faculty. Recent business meetings of the Branch featured guest speakers and films.

A report from the **University of Iowa Branch** lists the following new officers: Mary Wilke, president; Lynn Laflin, vice-president; Lucretia Gehrke, secretary; and William Grossman, treasurer. Harvey Coontz was named union board representative.

New officers chosen by the **University of California Branch** are: Leland J. Harris, president; Mary Patricia Likely, vice-president; and James E. Green, secretary-treasurer. The Branch has set a goal of 100% membership next term.

Officers elected by **Massachusetts College of Pharmacy Branch** are: John W. Webb, president; Randall Tinker, vice-president; Shirley Bartlett, secretary and Alfred J. Valcourt, treasurer.

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New A. Ph. A. Members

THE ASSOCIATION EXTENDS A CORDIAL WELCOME TO THE FOLLOWING MEN AND WOMEN WHO WERE ACCEPTED FOR ACTIVE MEMBERSHIP DURING THE MONTH PRECEDING PREPARATION OF THIS ISSUE.

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Braiden, Mary Carolyn, Los Angeles
Busick, Claude L., Stockton
Crosby, Philip A., Covina
Davalle, John P., Lynwood
Hooper, Alice D., Los Angeles
Larson, Willard F., Palo Alto
Martin, Florence L., Los Angeles
Rosen, Arthur A., Los Angeles

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Vandel, Frederick M., Washington

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Killeen, Edmond S., Chicago
Moore, Edmond E., North Chicago
Oxley, Fred V., Freeport

KENTUCKY

Bowen, Reginald S., Elizabethtown

LOUISIANA

Jackson, Henry S., New Orleans

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Freedman, George I., Newton Center
Lynch, Jean Mary, Maynard
Shapero, Rosalie, Springfield

MICHIGAN

Brawner, Alvie R., Battle Creek

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Tell, C. O., St. Paul

MISSOURI

Bradshaw, Charles C., Kansas City

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Farber, Kenneth, Bayonne
Feldberg, Michael A., Newark
Fleischner, Nathan, Nutley
Friedman, Samuel L., Elizabeth
Goldstein, Louis I., Newark
Hatchett, John F., Lakehurst
Jarvis, Edward R., Westfield
Kaplan, Jacob, Ridgefield Park
Thomas, Earl R., Pitman
Ulrey, Richard A., Colonia

NEW YORK

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Ganbarg, Marc, Bronx
Kaufman, Sydney W., Mt Vernon
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Proper, Roberts L., Staten Island
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Simon, Nathan P., Buffalo
Sullivan, Paul L., Brooklyn

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Dunnum, DeVerne G., Page
Haakenson, M. S., Hatton
Sinner, E. M., Fargo

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Fischer, Arthur L., Cincinnati
Kostell, Gustav C., Newburgh Hts.
Nakazawa, Warren M., Cincinnati
Semon, Thomas E., Pt. Clinton
Zeller, Edward J., Defiance

OKLAHOMA

Craighead, Warren R., Woodward

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Brinkman, Walter R., Philadelphia
Cullen, William B., Pittsburgh
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Walljasper, Aretas, LaCrosse

WYOMING

Shawyer, J. Earl, Laramie

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Howard, Ronald H., St. John, N. B., Canada
Converse, Amasa B., Diablo Heights, Canal Zone
Gabric, Mathew A., Ancon, Canal Zone
Garcia-Hernandez, Manuel, Vedado, Habano, Cuba
Munzel, Kurt Eugen, Baden, Switzerland
Ojha, K. N., Cuttack, India

Deceased Members

Bilbro, Q. T., Asheville, N. C., March 3, 1948

Crowley, Clifford T., Winnipeg, Man., Canada

Goedrich, Paul, Newark, N. J.

Snodgrass, L. K. (a life member), Little Rock, Ark., May 1, 1948

Smith, J. B. (a life member), Manchester, N. H., May 8, 1947

NNR

PRODUCTS RECENTLY ACCEPTED BY THE A. M. A. COUNCIL ON PHARMACY AND CHEMISTRY

Council descriptions of drug products are published regularly in THIS JOURNAL *as they are accepted. Rules upon which the council bases its action appeared in the July (7:320) 1946 issue, and may be secured in pamphlet form upon request to the Secretary, Council on Pharmacy and Chemistry, American Medical Association, 535 N. Dearborn St., Chicago 10, Ill.*

ISOBORNYL THIOCYANOACETATE-TECHNICAL.—$C_{13}H_{19}N_2OS$.—M. W. 253.35. The technical grade of isobornyl thiocyanoacetate contains 82% or more of isobornyl thiocyanoacetate with other terpenes.

Actions and Uses.—Isobornyl thiocyanoacetate is one of the thiocyanates shown to be effective as a pediculicide. A mixture of the technical grade of this compound with dioctyl sodium sulfosuccinate in the form of an oil emulsion is useful for external application to eradicate both the adult and ova forms of Phthirius pubis, Pediculus humanus capitis and Pediculus humanus corporis. Skin irritation studies reveal that the compound may act as a mild primary irritant to the skin of some persons, but there is no evidence that it acts as a sensitizing agent. It should not be applied too close to the eyes or to mucous membranes.

Dosage.—An oil emulsion containing isobornyl thiocyanoacetate-technical 5%, dioctyl sodium sulfosuccinate 0.6% is applied externally in amounts of 30 to 60 cc. depending on the site involved (quantity of hair), worked into a lather and allowed to remain for from five to ten minutes. In the case of the scalp, the hair is then combed and permitted to dry, and the emulsion is left on over night. The head is washed the following day. In the case of the pubis and other regions of the body, the emulsion is worked into a lather and then washed off with soap and water. Care must be taken that the emulsion does not remain in contact with the skin for too long. More than two such applications should be avoided.

Tests and Standards.—

Isobornyl thiocyanoacetate-technical occurs as a yellow, oily liquid, possessing a terpene-like odor. It is very soluble in alcohol, benzene, chloroform and ether; it is practically insoluble in water.

For tests and standards see *J. Am. Med. Assoc.*, **136**: 1099, 1948.

Wyeth Incorporated, Philadelphia 3

Lotion Bornate: 60-cc. and 3.785-liter bottles. An emulsion containing isobornyl thiocyanoacetate 5%, dioctyl sodium sulfosuccinate 0.6 % in mineral oil 5%, gelatin 0.6 % and water.

OXIDIZED CELLULOSE.—Hemopak-Johnson & Johnson.—Absorbable cotton or gauze.—Cellulosic acid.—$(C_6H_8O_6)$.—M. W. n(176.12). Oxidized cellulose is prepared by the nitrogen dioxide oxidation of surgical gauze or cotton. Cellulosic acid is a polyanhydroglucuronic acid having a minimal carboxyl content of 16%, a nitrogen content not in excess of 0.5% derived from the nitrogen dioxide used in its preparation, and a formaldehyde content not in excess of 0.5% derived from the formaldehyde used in its sterilization.

Actions and Uses.—Oxidized cellulose, a specially treated form of surgical gauze or cotton, exerts an unusual hemostatic effect and possesses the property of absorbability when buried in the tissues. Its hemostatic action is dependent on the formation of an artificial clot by cellulosic acid, which has a pronounced affinity for hemoglobin but does not enter per se into the physiologic mechanism of clotting. Absorbability depends on the size of the implant used, the adequacy of the blood supply to the area and the degree of chemical degradation of the material. Absorption of oxidized cellulose ordinarily occurs between the second and seventh days following implantation of the dry material, but complete absorption of large amounts of blood-soaked material may take six weeks or longer.

Oxidized cellulose is of value as an aid in surgery for the control of moderate bleeding under conditions where suturing or ligation is technically impractical or ineffective. Such situations include the control of capillary, venous or small arterial hemorrhage encountered in operations on the biliary tract, partial hepatectomy, resections or injuries of the pancreas, spleen or kidneys, bowel resections, amputations, resections of the breast, thyroid and prostate and in certain aspects of neurologic and otolaryngologic surgery. Oxidized gauze is employed as a sutured implant or temporary packing depending on the anatomic site or structures involved. Oxidized cotton is used primarily for neurologic surgery as unsutured packing, small portions of which may be left unremoved to control small areas of oozing from the dura or brain tissue. This material is likewise useful as temporary packing for control of secondary hemorrhage following adenoidectomy, tonsillectomy and other oral procedures and for control of alveolar bleeding following tooth extraction. Neither oxidized gauze nor cotton should be used for permanent packing or implantation in fractures, because it interferes with bony regeneration and may result in cyst formation.

The hemostatic action of oxidized cellulose is not enhanced by the addition of other hemostatic agents such as thrombin, which would be destroyed by the low *p*H of the material, and it has been shown that the hemostatic action of either alone is greater than the combination. The hemostatic effect is greater when the dry material is applied, so that moistening with water or sodium chloride solution is not recommended. When properly used, oxidized cellulose

(Continued, page 448)

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may be closed in a clean wound without drainage, but this is hazardous whenever gross contamination is suspected or frank infection is present.

Neither oxidized gauze nor cotton should be used as a surface dressing except for the immediate control of hemorrhage, as cellulosic acid inhibits epithelialization.

Dosage.—The amount of oxidized gauze or cotton used varies with the circumstances of the particular case. As a general rule, only the minimal amount required to control hemorrhage should be used. For the control of hemorrhage from the prostatic bed, this may vary from one to four 2- by 14-inch (5.18 by 35.6 cm.) gauze packing strips, depending on the extent and vascularity of the area to be packed and the technique employed. This size of oxidized gauze is particularly designed for implantation by means of mattress sutures. Gauze packing strips ½ inch by 2½ yards (1.27 by 228.6 cm.) are adapted for otolaryngologic or dental procedures; cotton pads 2 by 6 inches (5.08 by 15.24 cm.) are designed for neurologic, oral and/or dental surgical procedures.

In the event that it is desired to remove gauze or cotton from a hollow viscus or drainage site before dissolution is complete, removal can be facilitated by irrigation.

Tests and Standards.—

Oxidized cellulose in the form of gauze or cotton is slightly off-white in color, is acid to the taste and possesses a slight charred odor. It is soluble in dilute alkalies but insoluble in acids and water.

For tests and standards see *J. Am. Med. Assoc.*, 136: 829, 1948

Johnson & Johnson, New Brunswick, N. J.

Hemo-Pak Absorbable Gauze Packing Strip (4 ply)—2 by 14 inches (5.08 by 35.56 cm.) and ½ inch by 2½ yards (1.27 by 228.6 cm.) in sealed tubes.

Hemo-Pak Absorbable Cotton Pad: 2 by 6 inches (5.08 by 15.24 cm.) in sealed tubes.

U. S. trademark registration pending.

RIBOFLAVIN (See New and Nonofficial Remedies, 1947, p. 511).

The following additional dosage form has been accepted:

Walker Vitamin Products, Inc., Mount Vernon, N. Y.

Tablets Riboflavin: 10 mg.

SULFAMERAZINE (See New and Nonofficial Remedies, 1947, p. 125).

The following dosage form has been accepted:

Abbott Laboratories, North Chicago, Ill.

Tablets Sulfamerazine: 0.5 Gm.

SULFADIAZINE (See New and Nonofficial Remedies, 1947, p. 120).

The following dosage form has been accepted: *Mc Neil Laboratories, Inc., Philadelphia.*

Liquoid Sulfadiazine: 120-cc. and 480-cc. bottles.

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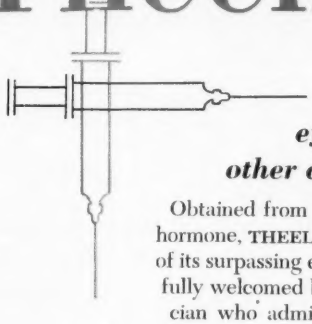

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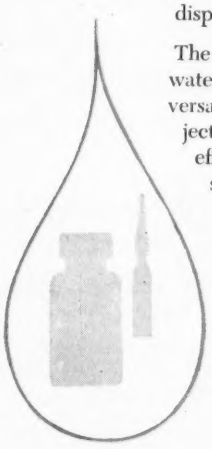

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Justin L. Powers, Ph.D., National Formulary, *Scientific Edition* of the JOURNAL; Melvin W. Green, Ph.D., laboratory and library; Glenn Sonnedecker, B.Sc., public relations, *Practical Pharmacy Edition* of the JOURNAL; Gloria Niemeyer, B.Sc., hospital pharmacy; W. Paul Nowell, B.Sc., finance and personnel; Mary Louise Bergner, A. B., membership; Franklin L. Deibert, exhibits, supplies, building and grounds.

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I attach the label I am now using. Please suggest design and uniform packages. It is understood I am under no obligation by reason of this request.

_____

_____

_____

Unique in principle a Torsion Balance retains its initial sensitivity because there are no knife edges.

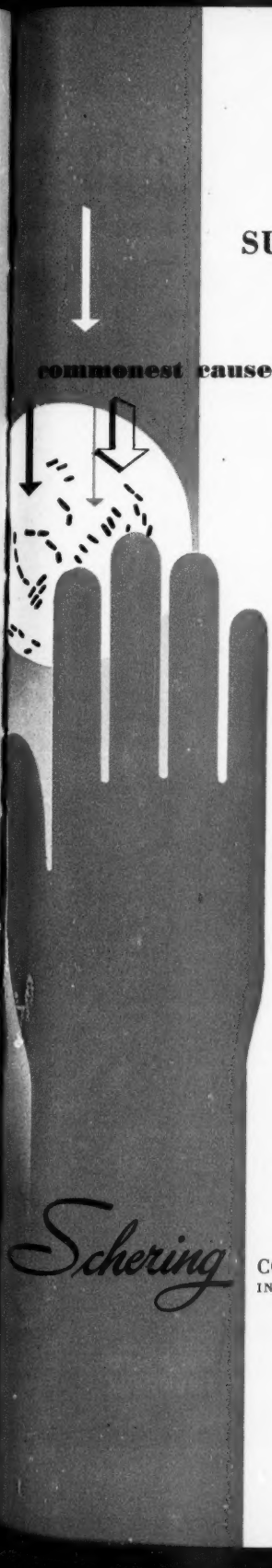
Jealously Guarded

For a person or a business, a fine reputation when once gained is held delicately in balance. Of all men and all professions, those in pharmacy are most keenly alert, most jealously on guard. In similar fashion, to certify absolute integrity of craftsmanship in the making of Prescription Balances is no light responsibility. Yet the pharmacist rightly takes for granted that the one on his counter will function with unerring accuracy through years on end. So long, sometimes, that he overlooks its having become outmoded.

The Torsion Balance Company

92 READE STREET • NEW YORK 13, N. Y.

Sales Offices: New York • Chicago • Dallas • San Francisco



SULAMYD FOCUSES ON THE *colon bacillus*

commonest cause of urinary tract infections . . .

SULAMYD* searches out and attacks *B. coli* so rapidly that "results that follow its use are uncanny. Occasionally the urine is sterile at the end of one day's treatment."[1]

RECOVERY or improvement in 98% of 200 cases of acute and chronic infections of the urinary tract was noted by Welebir and Barnes,[2] typical of the brilliant results achieved with SULAMYD. For prophylaxis, too,

SULAMYD

(Sulfacetimide-Schering)

is the chemotherapeutic agent of choice. In a group of 4,000 women treated prophylactically with various sulfonamides after pelvic surgery, SULAMYD proved the most effective, reducing urinary complications to less than 1%.[3]

HIGH DEGREE OF SAFETY is coupled with this remarkable antibacterial action. Highly soluble either in alkaline or acid urine and rapidly eliminated by the kidneys in high concentration, SULAMYD has an extremely low toxicity, far less than that of other sulfonamides.[4] Concrement formation has never been reported with SULAMYD.

SULAMYD (Sulfacetimide-Schering) Tablets of 0.5 Gm. in bottles of 100 and 1000. Bottles of 5.0 Gm. powder for laboratory determinations of urine and blood concentrations.

BIBLIOGRAPHY: (1) Wesson, M. B.: West. J. Surg. **49**:662, 1941. (2) Welebir, F., and Barnes, R. W.: J.A.M.A. **117**:2132, 1941. (3) Younge, P. A.: Urol. & Cutan. Rev. **49**:422, 1945. (4) Kearns, W. M., in discussion on Herrold, R. D.: Wisconsin M. J. **41**:467, 1942.

*®

Schering CORPORATION • BLOOMFIELD, NEW JERSEY
IN CANADA, SCHERING CORPORATION LIMITED, MONTREAL

SULAMYD

SCHERING

New prescription product

Product descriptions may be clipped and filed on three- by five-inch cards. These are also indexed for q reference in the "Monthly Drug Index" appearing on the last page of each issue. A product is described this column for the information of pharmacists who may be asked by physicians to stock the drug, or who ma receive professional inquiries about it. A listing does not imply evaluation or recommendation by the Associa tion, nor does omission of any product have significance concerning its merit.

COMPOUND SULFADIAZINE, SULFAMERAZINE AND SULFATHIAZOLE

Description: Contains sulfadiazine, sulfamerazine and sulfathiazole in equal parts.

Form Supplied: Tablets in bottles of 100 and 1000 (Ives-Cameron); tablets in bottles of 100 and 500 (Upjohn).

Action: Systemic anti-infective (for infections susceptible to sulfonamides except meningitis). The sulfonamide triad is said to produce the antibacterial effect of an equivalent dose of any one of the three drugs, but with less tendency to crystallize out of the urine. Contraindicated in infections not susceptible to any of the component drugs

Administration: Orally, as indicated.

Source: Ives-Cameron Co., Inc., 22 E. 40th St., New York 16—"Combadine."

The Upjohn Co., Kalamazoo 99, Mich.—"Three Sulfonamides."

RUPHYLLIN

Description: Contains aminophyllin, rutin and phenobarbital.

Form Supplied: Tablets in bottles of 100 and 1000.

Action: Smooth muscle spasmolysis, vitamin P therapy and sedation.

Administration: Orally, one tablet three times a day, and up to six tablets daily as determined by physician.

Source: G. D. Searle & Co., Chicago 80, Ill.

RUTIN AND ASCORBIC ACID TABLETS

Description: Rutin, a flavone glucoside (tasteless, yellowish powder obtained principally from buckwheat), in combination with ascorbic acid. Each tablet contains rutin, 20 mg. and ascorbic acid, 50 mg.

Form Supplied: Tablets in bottles of 100.

Action: Believed helpful in restoring normal capillary resistance and may be of value in preventing an increase in capillary fragility due to such drugs a thiocyanate, sulfadiazine, gold salts and aspirin. Adequate ascorbic acid intake is believed to augment action of rutin.

Administration: The usual dosage is 20 mg. rut three times daily, with a dosage of 40 mg. th times daily for severe or refractory cases. Ther is continued indefinitely in those cases in which rutin appears to be of value, as relapses are likely to occur after its withdrawal.

Source: The Upjohn Co., Kalamazoo 99, Mich.

TESTOSTERONE PROPIONATE SOLUTION

Description: Testosterone propionate, U. S. P., a steroid compound having androgenic characteristics.

Form Supplied: Sterile solution in oil; 10-cc Steri-Vials containing 25 mg. per cc., or 50 mg. per cc.

Action: Provides replacement therapy in conditions where there is a deficiency of androgens.

Administration: Intramuscularly as indicated; official average dose is 25 mg.

Source: Parke, Davis & Co., Detroit 32, Mich.

TRIMETON TABLETS

Description: Prophenpyridamine(1-phenyl-1-(2-pyridyl)-3-dimethylaminopropane).

Form Supplied: Scored tablets of 25 mg. in bottles of 100 and 1000.

Action: Antihistaminic.

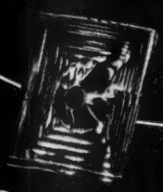
Administration: Orally, as indicated. A commonly prescribed dosage is one 25-mg. tablet three times a day for adults; one-half tablet (12.5 mg.) three times a day for children over four years of age; and under that age one-quarter tablet three times daily.

Source: Schering Corp., Bloomfield and Union, N. J.

Aerosol Inhalation Therapy

GREATLY SIMPLIFIED WITH

SOLUBLE TABLETS
CRYSTALLINE PENICILLIN G POTASSIUM



Each foil wrapped tablet contains 50,000 units, the usual single dose.

The tablet is simply dropped into the nebulizer

10 to 15 minims of water or saline solution are added with a dropper,

and the prescribed dose is ready for administration.

Aerosol inhalation therapy in the home is rendered exceedingly simple when Soluble Tablets Crystalline Penicillin G Potassium are prescribed. Each tablet contains 50,000 units of penicillin, the usual single dose, and is entirely free of binder or excipient. The tablet is simply dropped into the nebulizer, 10 to 15 minims of water or saline solution are added, and the patient can then receive the treatment. Thus the need for first dissolving the penicillin and then measuring the required dose is obviated entirely. Soluble Tablets Crystalline Penicillin G Potassium dissolve rapidly with slight agitation. Available at your wholesaler now in boxes of 24, each tablet individually wrapped in foil.

C.S.C. Pharmaceuticals

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RELIEF IN BRONCHIAL ASTHMA

MYOCARDIAL STIMULATION

DEPENDABLE DIURESIS

Aminophylline (Massengill) finds many fields of usefulness in the management of the cardiac patient and the patient afflicted with bronchial asthma.

In congestive heart failure, Aminophylline is a valuable diuretic, and also exerts a stimulating influence on the myocardium. Thus the organism not only loses accumulated fluid, but the cardiovascular system is also benefited by the greater cardiac output which results from stimulation of the heart muscle.

In bronchial asthma, Aminophylline exerts a relaxing effect upon the bronchial musculature, making possible greater pulmonary ventilation.

Average dose, 0.1 Gm. three times daily. This quantity may be doubled if necessary. Aminophylline (Massengill) is supplied in tablets of 0.1 Gm. in bottles of 100, 500, and 1,000, and in tablets of 0.19 Gm. in bottles of 100 and 500.

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

THE S. E. MASSENGILL COMPANY
Bristol, Tenn.—Va.
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SE CO MASSENGILL

AMINOPHYLLINE

Ciba announces the only antihistamine in eye-drop form!

ANTISTINE OPHTHALMIC SOLUTION

And, in addition to the ophthalmic solution, Antistine is available in tablet form for oral use—an effective, general antihistamine with very low side effects

Antistine Ophthalmic Solution is the only antihistamine available for topical use in the eye, *and meets a widely prevalent, long-felt need.*

Thousands upon thousands of people suffer from the *ocular* symptoms of allergies—itching and tearing of the eyes. Now, in the great majority of cases, they can usually find immediate, dramatic relief with Antistine Ophthalmic Solution.

You can anticipate prescription sales in volume. Be sure to order Antistine eye drops.

Moreover, physicians will recognize the advantages of Antistine Tablets for the relief of *general* allergic symptoms. These tablets combine powerful antihistaminic activity with *very low-toxicity* in relieving the symptoms of hay fever, perennial allergic rhinitis, urticaria, atopic dermatitis, pruritus, eczema, serum reactions and desensitization reactions.

Both forms of this new Ciba antihistamine are being widely promoted by sampling and detailing to physicians in your locality. *Stock both forms.*

ISSUED: *Ophthalmic Solution of 0.5% in ½ ounce bottles with dropper. Tablets of 100 mg. in bottles of 100 and 1,000.*

Ciba

This Ciba Product is being strongly promoted by:
1. DETAIL MEN 2. DIRECT MAIL 3. MEDICAL JRNL. ADVERTISING

PHARMACEUTICAL PRODUCTS, INC., SUMMIT, NEW JERSEY

ANTISTINE HYDROCHLORIDE (brand of phenazoline hydrochloride)
T. M. Reg. U. S. Pat. Off. 2/1383D

HIVES!

An outbreak of urticaria may be an extremely distressing condition. The action of Suprarenalin (epinephrine U.S.P.) in the treatment of such conditions may appear almost miraculous. An injection or two and the itching ceases—the welts disappear. The secretion of the suprarenal medulla is a highly potent physiologic agent. It is all the more important therefore to make certain of the quality, purity and standardization of the preparation you employ. Behind SUPRARENALIN ARMOUR (epinephrine U.S.P.) are sixty years of experience in the manufacture of endocrine preparations. Armour chemists are skilled in preparing endocrine medicinals and, most significant of all, they have available the world's largest supply of fresh raw material from which to choose the best. In the treatment of urticaria, as in asthma, angioneurotic edema, anesthesia accident, asphyxia or nitritoid crisis, it is sound practice to specify "SUPRARENALIN *ARMOUR*."

ARMOUR *Suprarenalin*

Accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

Available in these forms:

Suprarenalin solution 1:1000
1 cc. ampoules, 30 cc. rubber-capped vials, and 1 ounce bottles.

Suprarenalin Crystals
1 grain vials.

Suprarenalin Inhalant 1:100
¼ oz. and 1 oz. bottles for oral inhalation.

This advertisement is appearing in leading medical journals

ARMOUR *Laboratories*

HEADQUARTERS FOR MEDICINALS OF ANIMAL ORIGIN • CHICAGO 9, ILLINOIS

Now You Can Get

CUTTER DERMESTHETIC OINTMENT*

in bulk jars, or tubes with new *slip-off* label

How's *this* for a profitable set-up? Dermesthetic Ointment—for fast, prolonged itch relief—now comes to you in choice of two packages, to suit the specific needs of your pharmacy...

NEW *SLIP-OFF* LABEL TUBE 'Just what the doctor ordered' —wrapped in your own prescription label. Dermesthetic Ointment in 1⅛-ounce tube, now slip-labeled with paper—easy to "strip-off" at your Rx counter.

BULK JAR — New 1-lb. dispensing jar — both convenient and more economical for filling bulk prescriptions. Dermesthetic Ointment contains:

Benzyl Alcohol — *for quick relief*
Phenol — *for intermediate action*
Benzocaine — *for prolonged comfort*

Greasless, it will not stain skin or clothes—requires no bandaging. Prescribed for itch caused by poison oak or ivy, industrial rashes, insect bites and other pruritic conditions.

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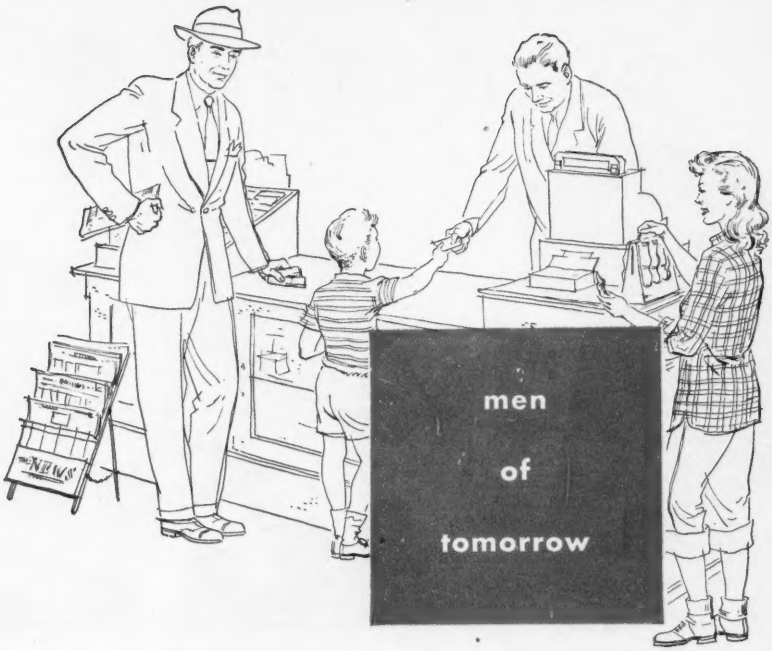

Nothing is more important to the pharmacist of today than the men and women of tomorrow. The little people who come to the pharmacy on simple errands are the fathers and mothers of a generation to come. The bright face of a child is a challenge to deserve the confidence so freely imposed. Diligent attention to the needs of the young is a professional responsibility. Eli Lilly and Company today is privileged to serve countless physicians and pharmacists whom it served indirectly as children five, six, or seven decades ago. Through the years it has sought to deserve the confidence of the physician, who prescribes, and the pharmacist, who dispenses, by making sincere, honest contribution to both public service and medical care.

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